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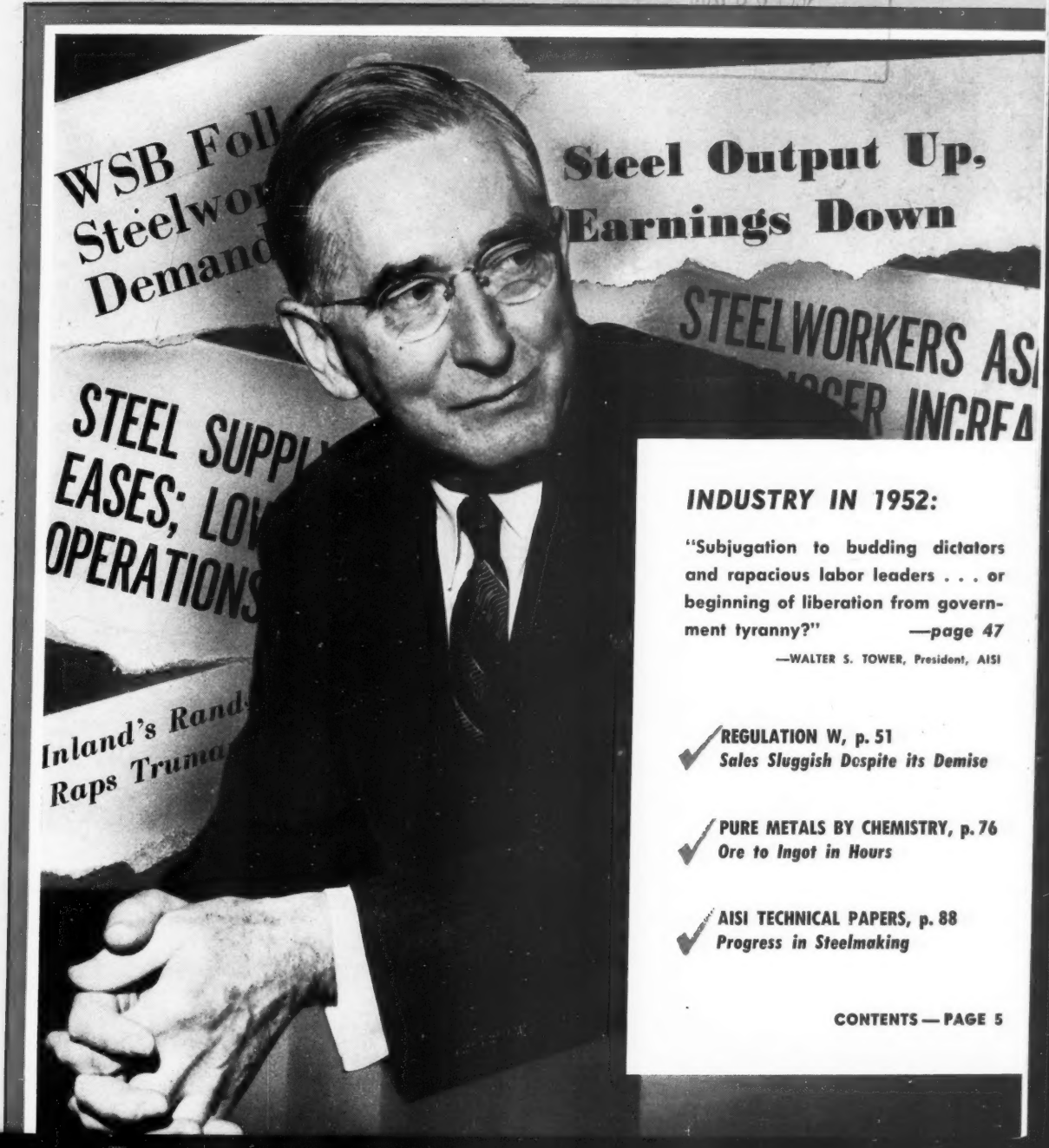
STEEL

THE WEEKLY MAGAZINE OF METALWORKING

OHIO STATE UNIVERSITY
MAY 30 1952



INDUSTRY IN 1952:

"Subjugation to budding dictators and rapacious labor leaders . . . or beginning of liberation from government tyranny?" —page 47

—WALTER S. TOWER, President, AISI

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Sales Sluggish Despite its Demise

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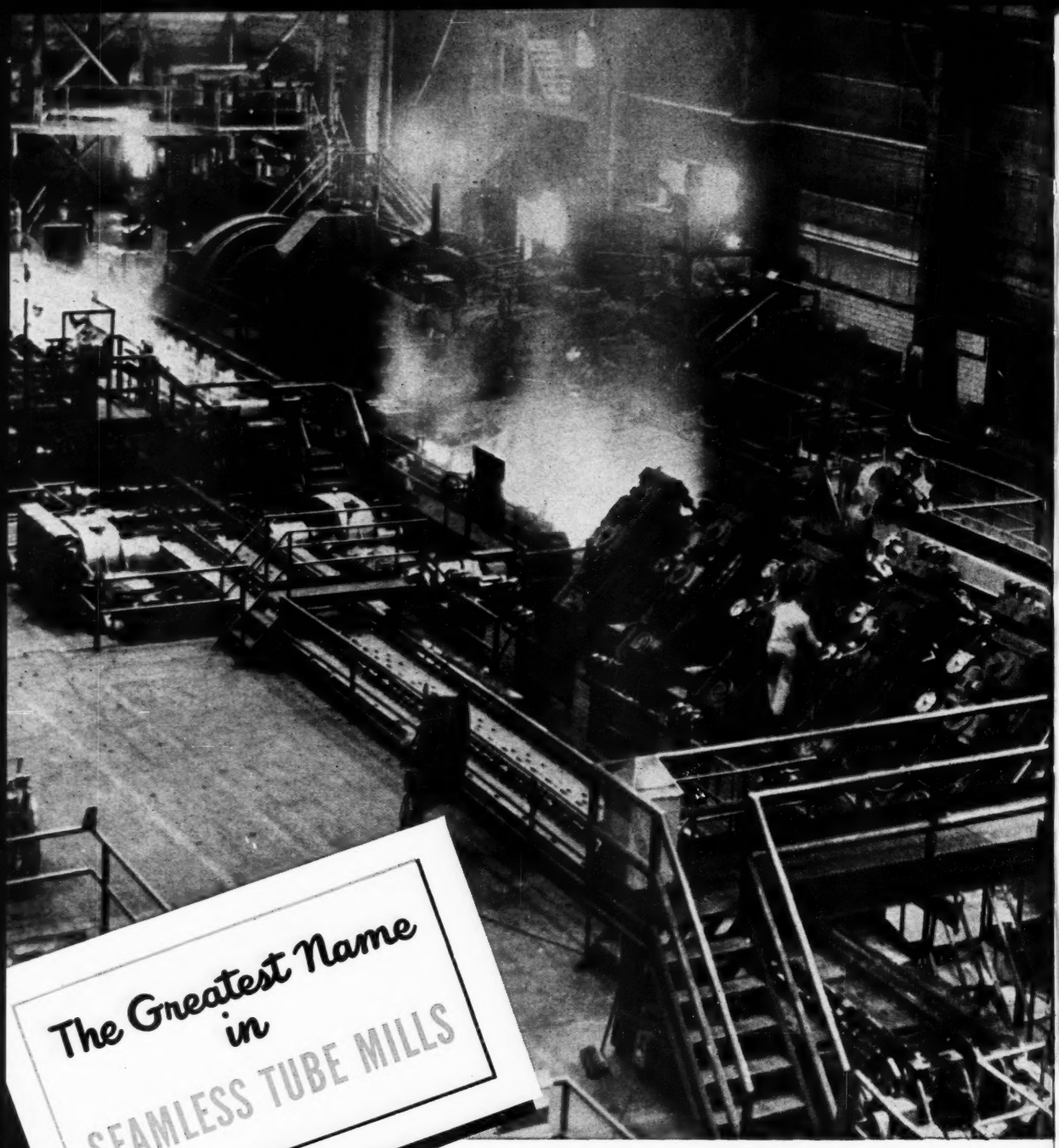

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LIFT THESE HOIST-TRUCK BODIES

The main hoist arms that raise and lower these heavy-duty hoist-truck bodies are an interesting example of design with low-alloy, high-strength Mayari R steel.

Used for loading and unloading cargo-carrying aircraft, these trucks eliminate any need for ramps or special hoisting equipment. The bodies, either empty or loaded, can be raised to the level of the plane floor and lowered to the level of the truck bed in a few seconds.

The main hoist arms that support the body are subjected to considerable bending moments as well as column stresses when heavy cargo is being handled. The designers used Mayari R to reduce the bulk and sections of these arms without sacrificing the necessary strength.

Mayari R has the superior mechanical properties needed for this kind of application. It has a yield-point of 50,000 psi minimum, almost double that of structural carbon steel. In addition, it has an endurance limit of 50,000 psi. Higher working stresses can be used with safety.

Mayari R is used in the as-rolled condition, eliminating any need for heat-treatment. It can be fabricated and welded by any of the methods used for carbon steel.

More information on this versatile grade of steel is readily available. Write or phone for a copy of Mayari R catalog 259.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

Heavy-duty hoist-truck bodies built by A. Cresci & Son, Inc., Vineland, N. J. The arms that lift these bodies are made of Mayari R.

Mayari R *makes it lighter... stronger... longer lasting*

Now! TOCCO* Induction Melting Furnaces for Precision Casting

One of the TOCCO Induction Melting Furnaces used at Arwood Precision Casting Co. Note TOCCO control station in background.

● Engineers at Arwood Precision Casting Co. use TOCCO Induction Melting Furnaces for melting and remelting quality steel. Other companies have found TOCCO equally adaptable for melting non-ferrous metals. No wonder! *Look at the advantages:*

- ★ Stepless power control
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- ★ High Efficiency on Intermittent Operation
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- ★ No Special Installation Charge
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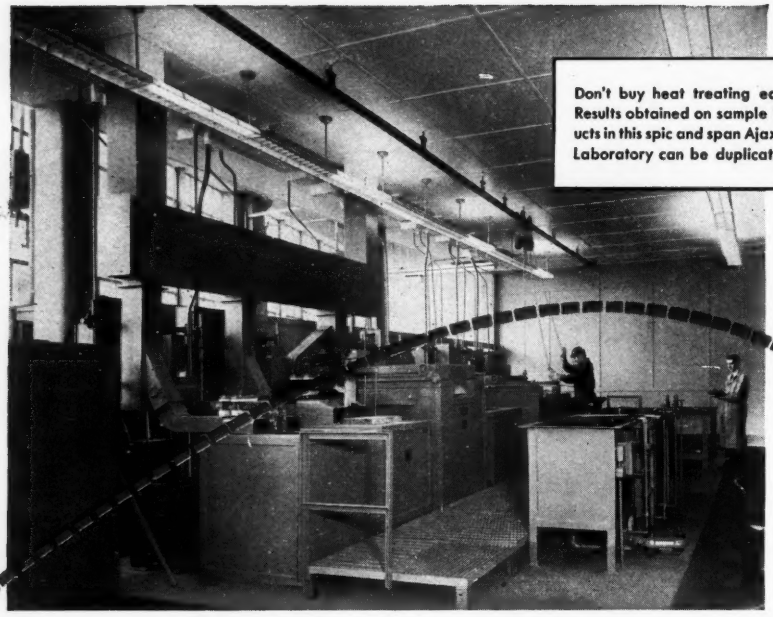

Don't buy heat treating equipment blindfolded! Results obtained on sample batches of your products in this spic and span Ajax Metallurgical Service Laboratory can be duplicated in your own plant.

Say Goodbye to Guesswork

ON HEAT TREATING RESULTS AND COSTS!

Without charge or obligation, the Ajax Metallurgical Service Laboratory will treat specimen parts by any of the following processes:

CARBURIZING
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HARDENING HIGH SPEED STEEL
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MARTEMPERING
PROCESS ANNEALING
CYCLIC ANNEALING
SOLUTION HEAT TREATMENT
DRAWING (Tempering)
DESCALING, CLEANING
DESANDING

What about the quality of the finished work? Will it be scale-free, devoid of decarb? Will the heat treatment prevent distortion and thereby reduce or eliminate costly grinding or finish machining operations? How much production will the furnace give per hour, and what floor space will be needed? What will the power, labor, maintenance and other heat treating costs amount to? *In short, will your proposed new furnace live up to the manufacturer's enthusiastic claims for it?*

You can be absolutely sure on all of these points *before* you buy an Ajax Electric Salt Bath Furnace for these reasons:

1—No Ajax salt bath furnace is ever sold until Ajax engineers—backed with experience in over 3,000 installations—are convinced it will do the job to your entire satisfaction *as well as to theirs.*

2—Before buying, we strongly urge that you utilize the facilities of the full commercial scale Ajax Metallurgical Service Laboratory. Send or bring batch lots of your materials for heat treating under actual working conditions. Let us prove beyond any question of doubt what can be done, how it can be done, and under exactly what conditions.

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World's Largest Manufacturer of Electric Heat Treating Furnaces Exclusively

952 Frankford Avenue **Philadelphia 23, Pa.**

AJAX ELECTRIC SALT BATH FURNACES

This Week in Metalworking

STEEL

Vol. 130 No. 21 May 26, 1952

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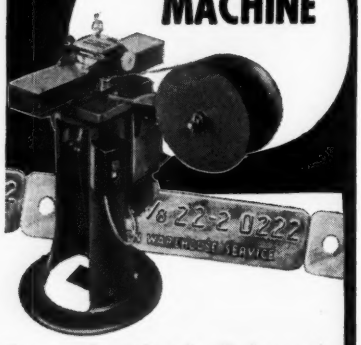

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Behind the Scenes...

Old Sea Dog

We climbed all over a new Great Lakes iron ore carrier a week or two ago. It was the *Philip R. Clarke,* built by American Ship Building Co. for U. S. Steel Corp.'s Pittsburgh Steamship Division.

We boarded the vessel one misty morning at 7:45 a.m. in Lorain, O., ready for about 12 hours of sea trials. Despite the fog, photographers got one good picture which you see below. That's us standing at the bow.

Capt. Arthur W. Dana was steaming the vessel out on Lake Erie for

a trial run. Aboard were the full crew, officials of Pittsburgh Steamship and American Ship, representatives from the instrument and machinery manufacturers whose equipment had been installed in the vessel and a full complement of newspapermen.

When we got on the ship and the vessel was underway, we found ourselves in the engine room where already a dozen or more men armed with flashlights and wrenches were swarming around the turbines like bears around honey. The greatest attraction was a control bank at the forward end of the engine room where some more men stared at 16 dials, occasionally made notations on ruled sheets of paper and talked to their companions in what seemed like a foreign language to us.

After the hubbub of the engine room, the deck seemed strangely quiet as we watched the Lorain skyline edge away in the fog. We walked the entire 647-foot length of the vessel three times and then told ourselves we had walked more than one-third of a mile. We ended up at the bow and inspected the officers' quarters which compare favorably with suites in the best hotels. We took a look at the crew's quarters which are also spacious and comfortable. We went up on the bridge for a short time and watched the ship being put through its paces.

After a while we went below decks and tried out the crew's recreation room. The television set was working well and we enjoyed a quarter-hour of a circus program. Lunch was welcome following such a strenuous morning, so we returned to the stern and a sumptuous mess.

The lunch left us feeling a little sluggish, and some hardy soul suggested a game of touch football in one of the ship's holds. Each of the three is big enough to accommodate such a sport easily. We begged off from so strenuous a pursuit and lay down on a bed in a spare stateroom. We woke up some three hours later to what appeared to be a great lurch of the vessel.

With 7000 horsepower pushing the *Clarke* ahead at 18 miles per hour, the engines were suddenly reversed. She was moving in the opposite direction at 107 revolutions per minute in a matter of 4 minutes, 21 seconds.

In fact, except for a few minor things, the *Clarke* put on a highly satisfactory performance. Just four days after her trials she was steaming up the Lakes for her first load of ore, some 18,500 gross tons.

Puzzle Corner

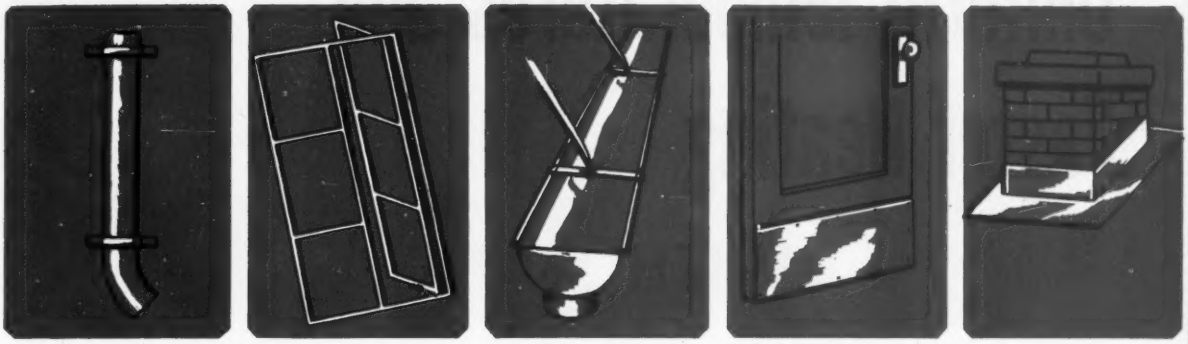
So many people have sent in the correct answer to the May 12 problem that we are carrying the names of only the first four. The ditch can be dug in four hours. So report Carl T. Crawford Jr. of Gillett & Eaton Inc., C. Clark of Pioneer Machine & Engineering Co., A. Richard Marcus who did not report his company affiliation and Murray C. Thaw of Littell Steel Co. Inc.

R. J. Vecciarelli of Mohawk Steel Co. Inc. submits this problem: If it takes one pipe to fill a pool in eight hours and another pipe to fill the pool in four hours and another pipe empties a pool in six hours, how long would it take to fill the pool when all are working together?

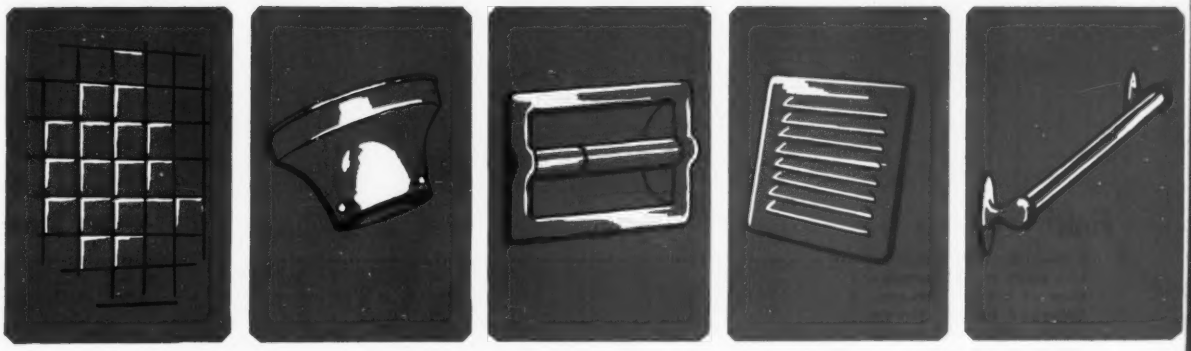
Shrdlu

(Metalworking Outlook — Page 39)

f you are a manufacturer of building materials



nd are caught in the critical material squeeze



nd are looking for a way out . . .

Many manufacturers of building materials find their production seriously threatened by NPA directives limiting or prohibiting production of their products from critical materials. Especially hard hit are manufacturers of building materials normally made of 18-8 stainless, brass, copper, aluminum, or chrome plated.

If your operations fall in any of these categories, then you will want to know more about Sharon '430' Stainless Steel. It is the best available material today for many such applications. Sharon '430' is a straight chromium grade of stainless with a record of successful application.

It is readily available with few restrictions as to end use. It may fit your production setup perfectly. If so, your critical material worries are ended.

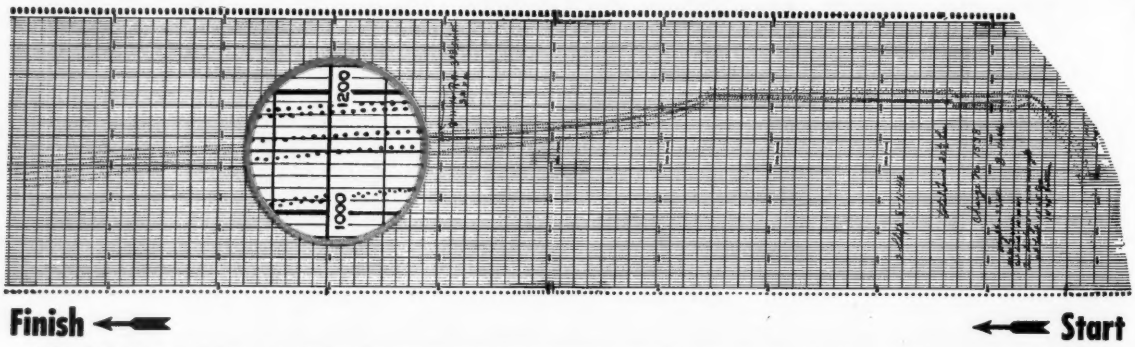
Get the facts on this popular stainless today. Contact your nearest Sharon representative or write direct. Engineering data and technical assistance are available without obligation. A new booklet describing how to use Sharon '430' Stainless may be obtained by writing direct to ***Sharon Steel Corporation, Department 8552 Sharon, Pa.***

Those manufacturing gutters, downspouts, flashing, etc., will want a copy of the new information-packed booklet *Sharon '430' for Better Roof Drainage Systems.* Available from district sales offices or by writing direct.

your answer is *Sharon 430 stainless steel*

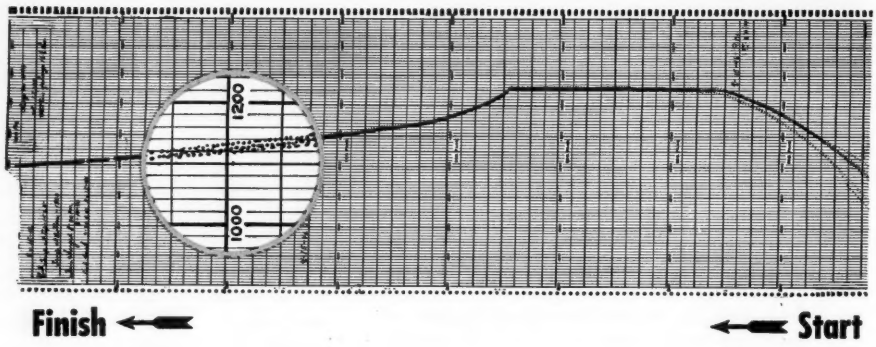
SHARONSTEEL

Uniform Temperatures and Faster Heating WITH BLOOM



(*Above*) The time-temperature curve before installation of Bloom Burners. Enlarged section shows temperature variation during cooling period.

(*Right*) Chart for a charge similar to the one above, after installation of Bloom Burners. Note uniformity of temperatures throughout charge during annealing and cooling periods, and 25% reduction of elapsed time.



The time-temperature curves above show how Bloom Tempered Flame Burners maintain uniform temperatures throughout the charge, and improve furnace operation and output. They represent two similar annealing heats for a car-type annealing furnace, one before and the other after Bloom Burners were installed.

The upper curve shows a test run previous to the change-over. Variation throughout the charge at the annealing temperature was from 1440 to 1540 degrees F., and at finish, it ranged from 840 to 1040 degrees F.

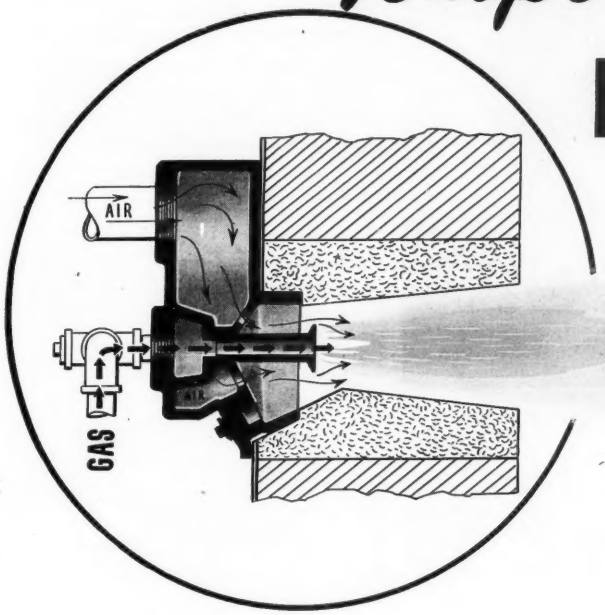
After installing Bloom Burners, the temperatures were held to within plus or minus 10 degrees F. for a similar charge, and the elapsed time was reduced 25 per cent.

The unique design of Bloom Tempered Flame Burners permits operation with a high per-

ENGINEERED

Tempered Flame

BURNERS

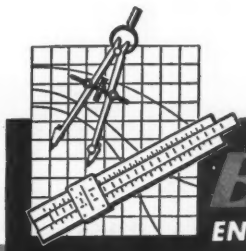


The Bloom Tempered Flame Burner is available in a wide range of capacities. The cross-section view above shows a typical burner.

centage of excess air. The burners operate with flame temperature only slightly higher than that required by the charge. Consequently hot and cold spots within the furnace chamber are eliminated, and the charge is heated uniformly. Five years of experience in a variety of applications have demonstrated the ability of these burners to increase furnace production, reduce costs and improve quality of product.

Write

for bulletin 1220-5, which describes Bloom Tempered Flame Burners. It gives dimensions and capacities for the various types.



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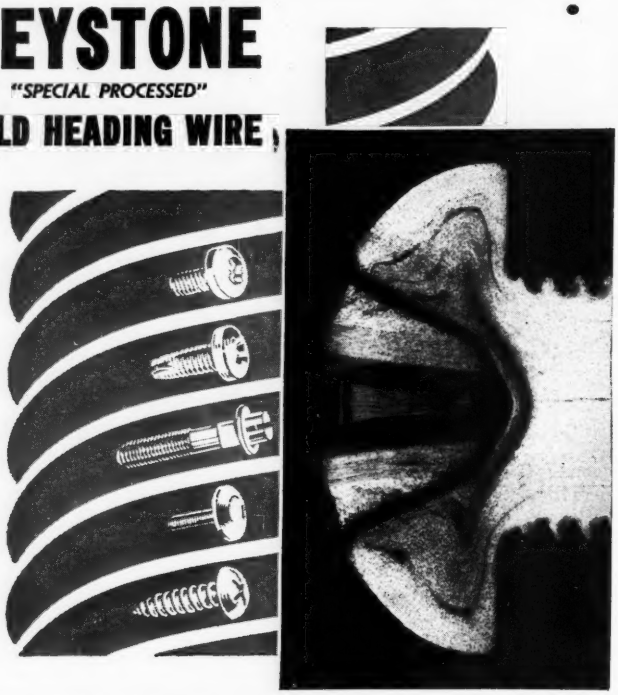

Thousands of "tough-to-make" pan-head recessed screws are made every day from Keystone "Special Processed" Cold Heading Wire. The extremely severe displacement of metal during manufacture of this type head requires special wire that will flow with unbroken fibres. (The above macrograph clearly shows long unbroken flow lines.)

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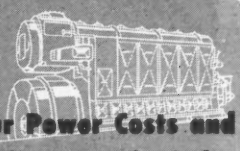

Put Your Power Costs and Performance in Order

1 ***Handle Peak Demand*** . . . reduce peak demand values for lower purchased power rates.

2 ***Power Factor*** . . . in-plant power generator can eliminate power factor penalties.

3 ***Emergency Power*** . . . insurance against lost production and damage resulting from line failures.

4 ***Handle Surge Loads*** . . . that may now be affecting current characteristics of entire plant.

5 ***Plant Expansion*** . . . need not be restricted due to lack—or expense—of ample power.

6 ***Useful Heat*** . . . lube oil, water and exhaust heat can be turned from waste to profit.

7 ***Chemical Value*** . . . exhaust gases are high in free nitrogen—available for economical fixation of nitrates, ammonia, etc.

8 ***Insurance Advantage*** . . . of diesel over gasoline engine, for example, will soon pay for installation.

9 ***No Weather Worries*** . . . ice, snow, sleet, wind storms can't stop plant operations.

10 ***Handle Increasing Load*** . . . in-plant power economically adds to current capacity as loads increase.

11 ***Fuel Economy*** . . . use diesel oil, natural gas or sewage gas for added economy.

12 ***Remote Locations*** . . . distance from transmission lines needn't curtail plant expansion.

13 ***More Compact Power*** . . . Fairbanks-Morse engines give you more power per foot of floor space, more power on present foundation.

14 ***Minimum Attendance*** . . . Fairbanks-Morse in-plant generating sets require far less supervision or maintenance.

15 ***Save Cost*** . . . of running in new line where present transformers and power lines are already loaded.

FAIRBANKS-MORSE,

a name worth remembering

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You measure earlier BEFORE reaching minimum work size. Less scrap. Same plug used on both rough and finished dimension. Total minus range .0015".

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You can read Undersize, Taper, Out-of-Round and Irregular Shape Holes without plug getting stuck. Easier to insert plug.

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As simple as setting a Dial Indicator. Direct and Positive.

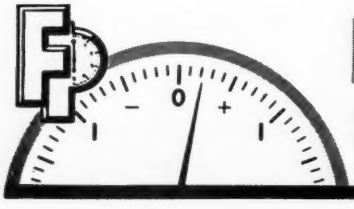
STAY-PUT ZERO — DON'T WORRY ABOUT PRESSURE FLUCTUATIONS
They do not affect accuracy. Set zero when you start — that's all. No drifting. Full Jeweled Cushioned Movement — more sensitive to size variations.

LONGER PLUG WEAR — JET FACES ARE DEEPER
Saves you real money.

ONE MASTER ONLY — FORGET THE IDEA TWO ARE NEEDED
Only air gage with enough precision to permit use of only one master. Interchangeable plugs — every plug calibrates on same scale.

TRY IT — AND PROVE IT TO YOURSELF

Only the Dimensionair provides the many important features above. Customers who have given the Dimensionair a thorough trial have found its advantages outstanding and have ordered many Dimensionairs in large quantities, and repeatedly. We invite you to try the Federal Dimensionair and compare it with any other air gage. Ask our nearest representative or write today for complete information and prices. FEDERAL PRODUCTS CORPORATION, 1215 Eddy Street, Providence 1, Rhode Island.



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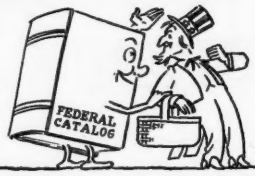
LETTERS
TO THE EDITORS

Help for Industry, Too



I believe that you have pointed up well the aspects of the federal catalog program that are of great interest to industry in your article "Can Procurement Red Tape Be Cut?" (Apr. 7, p. 88).

Development of the catalog must be accompanied by a rigorous program to bring more Federal supplies under specifications and to standardize them to the maximum extent. By revealing identical items now concealed under varying names and numbers, the federal catalog will be a valuable and necessary instrument of standardization.

Herbert Roback
House of Representatives
Washington

The Real Picture

MAY WE HAVE PERMISSION TO PHOTOSTAT TOP HALF OF PAGE 45 (Steel Wage Comparison Charts) APR. 28 ISSUE FOR USE IN OUR PLANT.

H. S. Pyle
United States Steel Co.
Gary Sheet and Tin Mill
Gary, Ind.

• *Glad to.*

Warning Sounded

Kindly forward 100 reprints of "It Can Happen Here" (Apr. 14, p. 59). It is our desire to distribute these to our employees so that they will be aware of the necessity to safeguard the rights of the American people.

I. W. Killian, vice president
Pines Engineers Co. Inc.
Aurora, Ill.

• *They're on the way.*

Magnesium Melting Point

We are regular readers of your "Production Engineering News at a Glance" and it is to your credit that we seldom have to refer to an error in the publication. However, in an article (Apr. 28, p. 73) in the second column you cite the ignition temperature of magnesium as 600° F. We assume this is a typographical error and should read "the melting point of magnesium is about 650° C" as is explained on p. 21 of our recent publication *Magnesium Alloys and Products.* A copy of which is enclosed.

Paul L. Filter
Dow Chemical Co.
Midland, Mich.

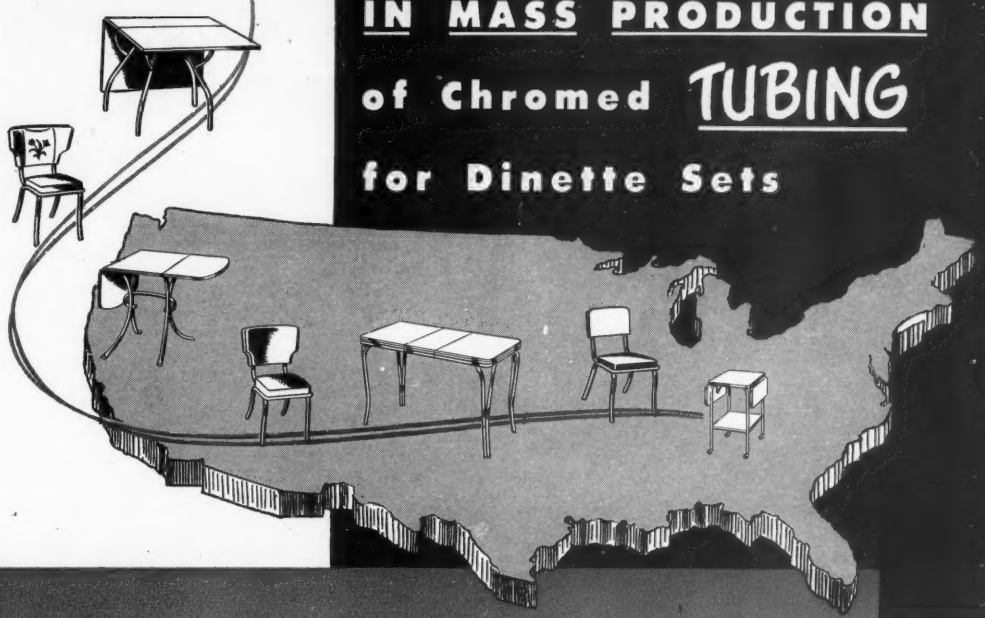
Kindly send us the manufacturer's name of the "Surfagage" (Mar. 24, p. 54).

P. E. Diamant
Schick Inc.
Stamford, Conn.

• *Write to J. B. Bidwell, General Motors Research Laboratories, Detroit.*

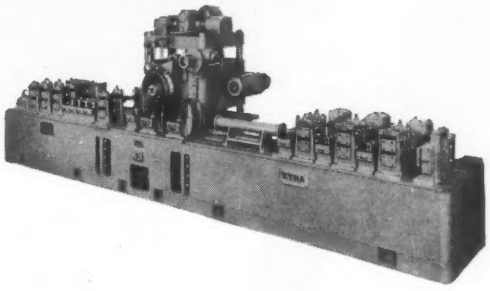
TO MAINTAIN NATIONAL LEADERSHIP..

DAYSTROM.. requires UNIFORMITY IN MASS PRODUCTION of Chromed TUBING for Dinette Sets



ETNA TUBE MILLS DO THE JOB at the rate of 120 FEET PER MINUTE!

Rigid standards of quality prevail at Daystrom Furniture Company. And to suit their *individual requirements*, Etna engineers designed and manufactured tube mills to produce steel tubing for Daystrom at the rate of 120 feet per minute! Etna Tube Mills mean faster, more uniform production of steel tubing for end uses as divergent as furniture and gas pipe. Consult Etna engineers for tube mills specially designed and constructed to suit *your* tubing requirements.



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★ Unmatched for close-quarter drilling—only 7¼" length—only ¾" spindle offset!

★ New handle shaped for plenty of finger room!

TRY THIS HUSKY HANDFUL OF POWER YOURSELF . . . TODAY!

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Let your nearby Black & Decker Distributor demonstrate this latest version of the most famous Drill in the electric tool industry! See for yourself how it will save you money, muscle and man-hours! See for yourself why experienced tool buyers hail it as a real champion! Or, write for full details to: THE BLACK & DECKER MFG. CO., 620 Pennsylvania Ave., Towson 4, Md.

HAVE you found it a problem to obtain strip steel exactly suited to your particular fabrication and end-use requirements? In many instances, standard or volume-produced steels simply can't fill the bill.

At Athenia, we "make it our business" to solve such problems, to develop and process special steels that are *precisely* right... cold rolled, high-carbon steels, produced in *controllable* batches, in widths up to 6½ inches and from .0015 to .062 inches thick.

For over 40 years Athenia customers have been receiving this personalized creative service —ever since skilled Swedish steelmakers founded this company to produce finer steels in America than come from *anywhere* abroad. It has made many lasting friends for Athenia—prominent manufacturers who want only the finest, precisely controlled steels for their razor blades, watches, textile machinery, saws, surgical instruments, typewriters, piston rings and scores of other precision products.

If you can do *better than ever* with a fine, specially engineered steel . . . if you have a tough, *unsolved* problem in steel . . . or if you are only interested in having your established specifications followed religiously . . . in any case, we welcome the chance to acquaint *you* with service the *Athenia* way.

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ATHENIA STEEL	*Clifton, N. J.*	Flat, High Carbon, Cold Rolled Spring Steel
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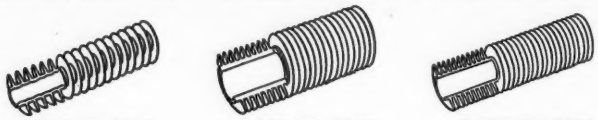
REYNOLDS WIRE	*Dixon, Illinois*	Industrial Wire Cloth
WAGNER LITHO MACHINERY	*Jersey City, N. J.*	Metal Decorating Equipment
WORCESTER WIRE WORKS	*Worcester, Mass.*	Round and Shaped Steel Wire, Small Sizes

WOLVERINE TRUFIN*

offered in a *Wide Choice of Combinations*

CHOICE OF THESE FIN SPACINGS



5 FINS PER INCH | 7 FINS PER INCH | 9 FINS PER INCH

11 FINS PER INCH | 19 FINS PER INCH

CHOICE OF THESE METALS

Copper, copper base alloys, aluminum, or in bi-metal—having aluminum fins with liners of copper, copper base alloy, or steel.

CHOICE OF SIZES

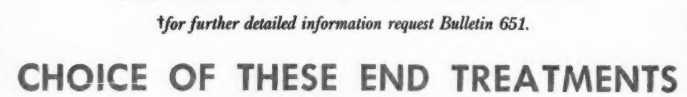
Inside diameters from ¼" to 1" †

Outside diameters of fin from ½" to 2" nominal

†for further detailed information request Bulletin 651.

CHOICE OF THESE END TREATMENTS

(Available in 19 fins per inch)††



Full finned tube | Both ends plain†† | One end plain; other end stripped†† | Both ends stripped, including bi-metal††

††Full finned end furnished in all sizes

AS EASILY FABRICATED AS PLAIN TUBE

Trufin, the integral finned tube—can be fabricated as easily as plain tube—can be bent to unbelievably small radii to achieve extreme compactness. Trufin is suitable for nearly all kinds of heaters, coolers, interchangers, condensers and many other heat transfer applications. WOLVERINE TUBE DIVISION, Calumet and Hecla Consolidated Copper Company, Inc., Manufacturers of seamless, nonferrous tubing, 1439 Central Ave., Detroit 9, Mich.

*REG. U. S. PAT. OFF.

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Production Pointers from GISHOLT

GISHOLT

TIME-SAVING IDEAS

Presented as a service to machine shops, we hope some of these interesting ideas, culled from thousands of jobs, will suggest ways to help you cut time and costs in your own metal work.

HYDRAULIC LATHES PAIR UP FOR BIG OUTPUT OF BEARING RACES

34 Pounds of Metal Removed in Two Fast Operations

Here's a setup for machining large spherical roller bearing races that may give you some practical ideas.

The job is done in two operations with the work divided between two Gisholt No. 24 Hydraulic Automatic Lathes. Together, they remove a total of 34 pounds of metal from the 86-lb. forgings of 52100 bearing steel.

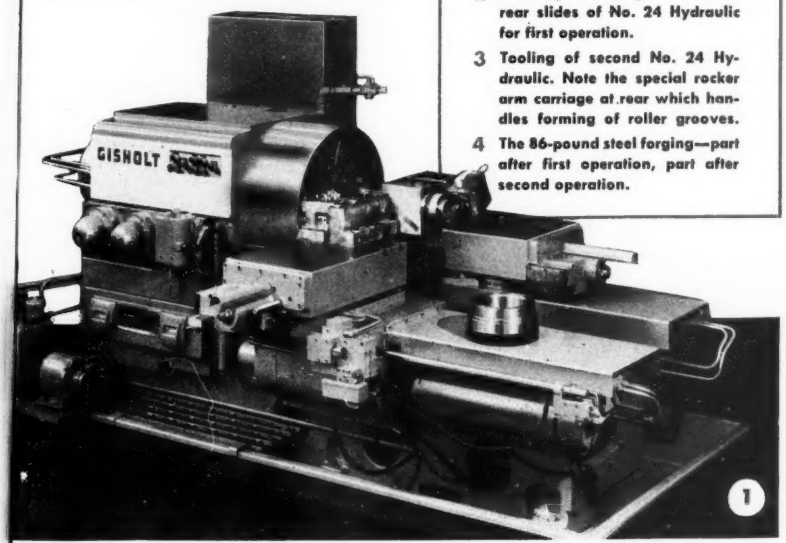
First operation: Part is chucked on the O.D. with a 3-jaw hydraulic chuck. Tools on the front slide turn up to the jaws and face, chamfer and form the radius to the bore. Boring is done from the rear slide, which has a special attachment that provides tool relief. Floor-to-floor time is only 2.80 minutes.

Second operation: A hydraulically operated arbor holds the part. Tools on the front carriage finish turn, face, chamfer and form the radius of the bore. A special rocker arm type carriage at rear tips in shaving tools to form both roller grooves. The form cutters measure 1⅞" wide. The husky No. 24 Hydraulic handles this chip load with ease, leaving an extremely smooth finish entirely free of chatter marks. Floor-to-floor time for this operation is also a brisk 2.80 minutes.

With their completely automatic cycle, these two No. 24 Hydraulics handle an interesting variety of operations with unusual speed.

PHOTO CAPTIONS

1. This No. 24 Hydraulic handles first operations on bearing races.
2. Close-up of tooling on front and rear slides of No. 24 Hydraulic for first operation.
3. Tooling of second No. 24 Hydraulic. Note the special rocker arm carriage at rear which handles forming of roller grooves.
4. The 86-pound steel forging—part after first operation, part after second operation.



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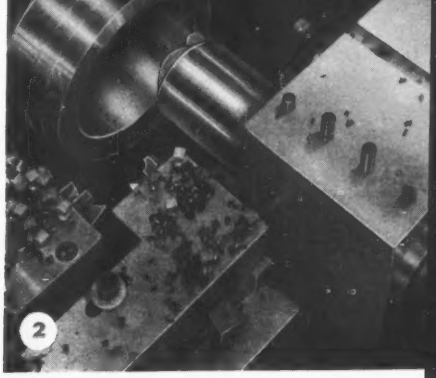
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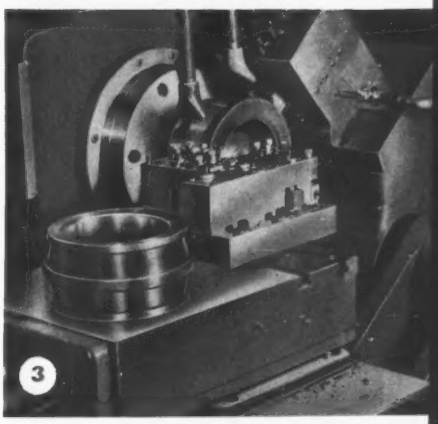
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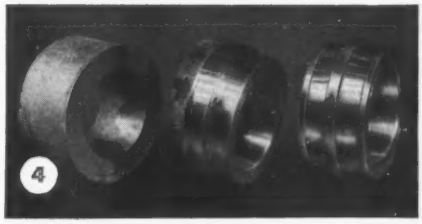
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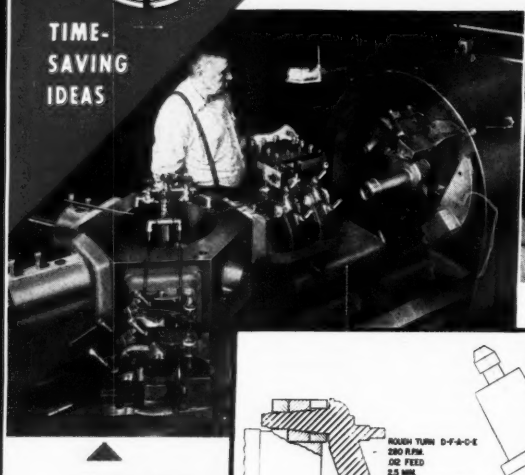
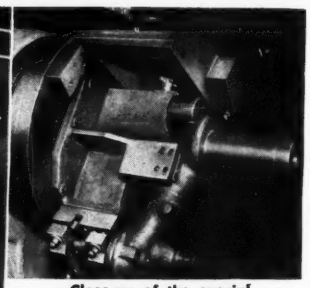
GISHOLT

TIME-SAVING IDEAS

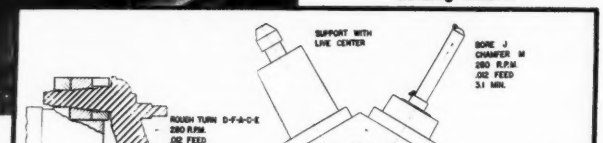
HOW TURRET LATHE HANDLES AWKWARD PART



The Gisholt 5L Saddle Type Turret Lathe used on this interesting job. Note turret coolant distributor.



Close-up of the special holding fixture.



Tooling layout for machining bogie axles.

Special Counterweighted Fixture Does the Trick!

This part was a tough proposition, from the holding point of view. It's a bogie axle—big, awkward and offset from the turning centerline.

The problem was solved with a Gisholt 5L Saddle Type Turret Lathe and a special counterweighted holding fixture. Fixture and part were balanced as a unit on a Gisholt Balancer to provide a faster operating speed.

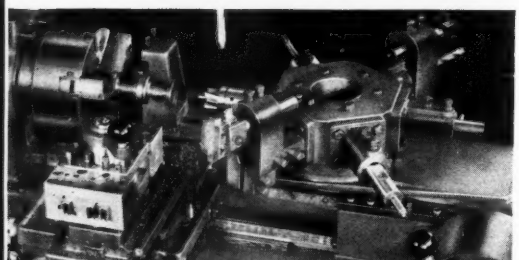
The previously machined hub is used for locating and driving. Conventional bar tools on the hexagon turret handle the turning and boring of the second hub. Tools on the quick-indexing square turret form, face and chamfer, while the hub is supported with a live center from the hexagon turret.

Floor-to-floor time for the larger of the two bogie axles is 20.5 minutes. Carbide-tipped tools are used throughout, with the spindle operating at 280 r.p.m.

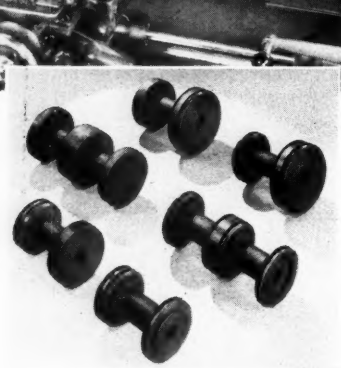
A special counterweighted holding fixture makes it possible to turn a difficult problem into a turret lathe job.

SPECIAL TOOLING SIMPLIFIES PISTON PRODUCTION

A Little Extra Tooling Goes a Long Way



Tool setup for machining exhaust pistons. Note special tool blocks on square turret for rough and finish grooving.



Exhaust pistons fully machined on No. 4 Ram Type Turret Lathe.

Here's a really businesslike setup for machining a variety of cast iron exhaust pistons. The machine doing the job is a Gisholt No. 4 Ram Type Turret Lathe.

The job is quite standard except for the grooving. Simple operations from the hexagon turret include boring, counterboring, reaming and step-turning. Facing between the flanges is done by a single forming tool mounted in the standard rear tool post.

Grooving is handled from the quick-indexing square turret on the front of the cross slide. This has been wisely planned around two special tool blocks, one having tools for rough grooving and chamfering, and the other with tools for finish grooving. During the grooving operation, the workpiece is supported by an arbor on the hexagon turret.

Both carbide and H.S.S. tool bits are combined to provide maximum cutting efficiency in a minimum of machining time.

Special tools on the cross slide of this Ram Type Lathe do rough and finish grooving on a variety of exhaust cylinders.

Jet engines present real machining problems. How turret lathes are solving many of these is told in a 4-page photo story. Write for your free copy. It has many helpful ideas.

GISHOLT

GISHOLT

TIME-SAVING IDEAS

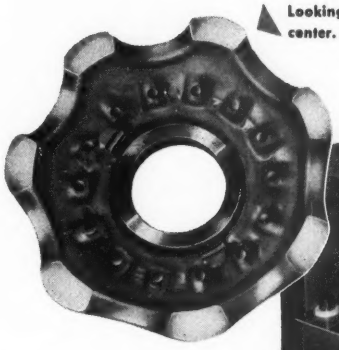
ALUMINUM FORGINGS WITH INTERRUPTED CUTS . . . NO PROBLEM HERE

Simplimatic Has Right Speeds and Feeds to Make Job Easy

Here's a job of turning aluminum with interrupted cuts. Normally it would present some real problems . . . but not the way it's worked out for the Simplimatic Automatic Lathe.

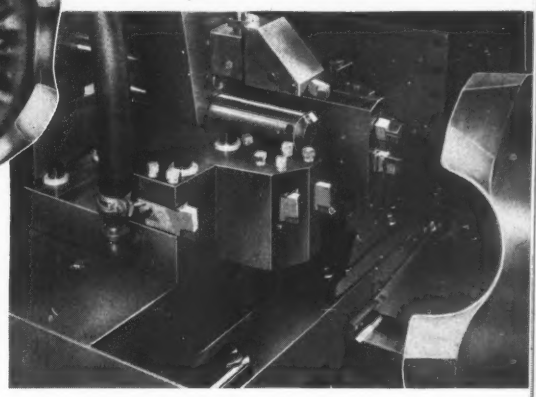
It's a bulky aluminum forging which becomes a crankcase center for an aircraft radial engine. A total of seven surfaces is machined, with two of the passes being heavy interrupted cuts. The part is located in the bore and held by an air-operated draw-back fixture. Tools on the front slide handle the recessing around the hub. Tools on the center slide chamfer the bore and finish turn the hub. Tools on the rear slide face the hub and the two sets of bosses.

Using a spindle speed of 500 r.p.m. and feeds of .010" and .005", the floor-to-floor time is an even four minutes. The parts are smooth and accurate, even with the interrupted cuts.



Looking into a machined aluminum crankcase center. Note the interrupted cuts.

Close-up, showing tooling on the Simplimatic's three slides.



The Simplimatic is ideal for this job because it permits three individual tool slides, each feeding at the best rate of feed for its particular work on this aluminum part.

FASTERMATIC MAKES FOUR PASSES TO FINISH TAPER BORE

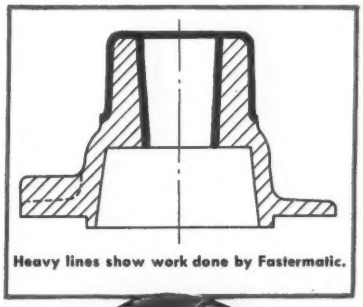
Automatic Cycle Permits Operator to Handle Other Machines

Most of the work on these cast alloy steel steering clutch couplings is in the bore. Four passes must be made through it to finish the taper.

The 2F Fastermatic has an air chuck for holding the part. Work starts with a step drill on the first turret station, cleaning out the cored hole. At the same time, the hub is rough turned and chamfered from the rear independent cross slide. On the second turret station the taper bore is roughed out with gang tools, while tools on the front cross slide finish face the hub and the flange at the base of the hub. The bore is rough taper reamed from station three and finish taper reamed from station four. Floor-to-floor time, using both H.S.S. and carbide tools, is 12.0 minutes.

With the job handled on a Fastermatic Automatic Turret Lathe, an operator is needed only for unloading and loading the parts. The remainder of the time, while the Fastermatic is going through the automatic cycle, he is free to work other machines.

All work on the hub and bore is performed automatically and in a single operation by the Fastermatic.



Heavy lines show work done by Fastermatic.

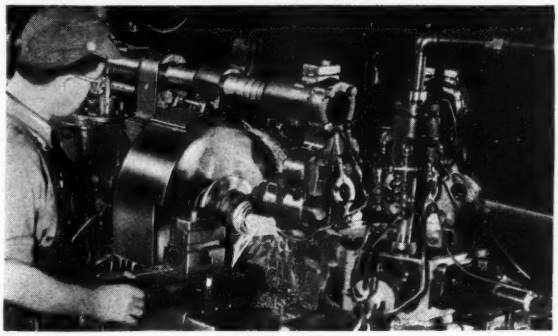
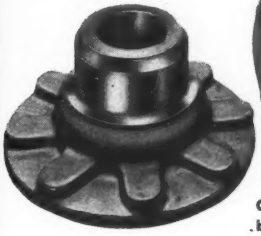


Photo shows start of automatic cycle for Fastermatic.



Complete couplings, showing taper bore and hub work.

GISHOLT

TIME-SAVING IDEAS

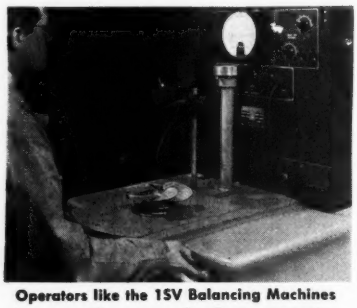
FAN BLADES BALANCED 400 PER HOUR

Vertical Machine Sets Record for Production Balancing

Here is the 1SV1 DYNETRIC Balancing Machine doing high volume balancing of small fans. Static unbalance is measured, located and corrected at a rate of more than 400 fans per hour. The operator reads the amount of unbalance directly from the meter in terms of small plugs which are pressed into the root of the blade with a hand tool.

The series of 1SV Balancing Machines are high production machines from every standpoint. They have all the newest electrical and mechanical improvements—plus a new vertical design which reduces operator fatigue to an absolute minimum and thereby increases daily output.

There are four models in the 1SV series—two for static balancing (single plane) and two for dynamic balancing (two plane). Write for literature.

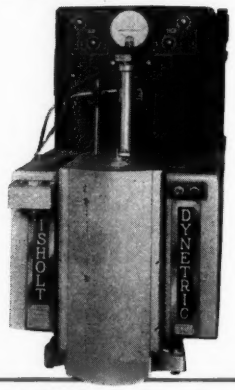


Operators like the 1SV Balancing Machines because they are simple to operate.

At a rate of 400 per hour, the cost of balancing these small fans is insignificant when compared to the added smoothness, greater quietness and longer life of the parts.

DYNETRIC BALANCERS GISHOLT

DEVELOPED JOINTLY WITH WESTINGHOUSE ELECTRIC CORPORATION "DYNETRIC" IS A TRADE MARK REG. U. S. PAT. OFFICE BY WESTINGHOUSE ELECTRIC CORPORATION



A new booklet "Static and Dynamic Balancing," carries helpful information reprinted from the latest A.S.T.E. Handbook. Write for your reprint. Also, ask for details and starting dates of the Gisholt Balancing School, the most complete training program of its kind available.

SUPERFINISHING GIVES BEARING SURFACES MUCH LONGER LIFE

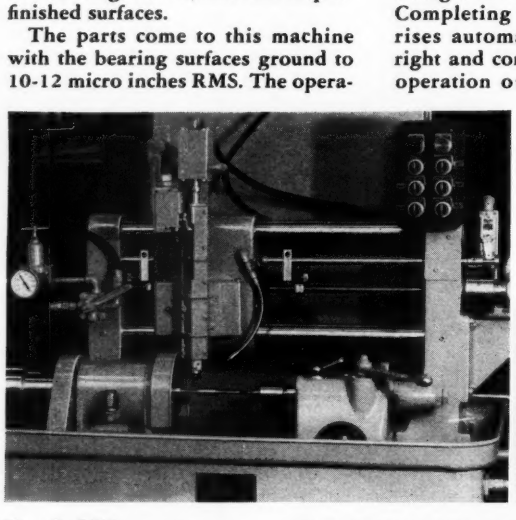
Fast Automatic Operation

The part you see loaded in this Special Model 50 Superfinisher is a stainless steel fan shaft rotor. The two bearing seals, one on each side of the large O.D., are the Superfinished surfaces.

The parts come to this machine with the bearing surfaces ground to 10-12 micro inches RMS. The operator merely loads the work, and presses a button to start this fully automatic cycle.

Rough Superfinishing on the .393" left bearing begins, with the part rotating at 350 r.p.m. Then the speed changes to 1000 r.p.m. for finishing. Completing this surface, the head rises automatically, moves to the right and comes down to repeat the operation on this second bearing. Finally, the head moves up again, part rotation and stone oscillation cease—and the automatic operation is completed. Both bearing surfaces now measure 3-5 micro inches RMS. Floor-to-floor time is just 35 seconds.

With Superfinishing, service life of these parts will be 4 or 5 times longer because the vital bearing surfaces are free from smear metal, chatter marks, grinder flats, etc.

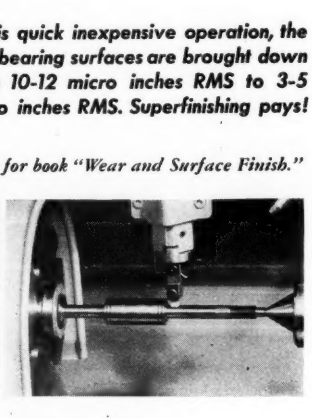


Special Model 50 used for Superfinishing bearing surfaces of fanshaft rotors.

First Superfinishing is on left bearing surface. Head then rises and moves to right to do second bearing surface.

In this quick inexpensive operation, the two bearing surfaces are brought down from 10-12 micro inches RMS to 3-5 micro inches RMS. Superfinishing pays!

Write for book "Wear and Surface Finish."



No. 5-652
589

GISHOLT

THE GISHOLT ROUND TABLE represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.

GISHOLT MACHINE COMPANY Madison 10, Wisconsin

Write for your copy of the new General Catalog.

TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

We've got a home...

thanks to- STRAIGHT-CHROME

Housing shortages for these little fellows no longer exist . . . thanks to the availability of straight-chrome stainless steel. The manufacturer of the illustrated "dwelling", forbidden the use of chrome-nickel stainless, found a straight-chrome grade that was free of controls—more readily available—and neatly filled all requirements.

Such substitutions are taking place with increasing frequency since the advent of nickel controls. If you find your product on the restricted list—or stainless procurement difficult—we urge that you consider the advantages of making a change. Straight-chrome analyses possess properties that permit their use for a wide range of applications—and it's a good bet that Frasse has one on hand to fill your particular need.

Frasse stocks of straight-chrome stainless steels are in good supply, and Frasse Technical Service is freely available to help guide you in their application. For straight-chrome stainless steels or qualified engineering assistance, call *Peter A. FRASSE and Co., Inc., 17 Grand St., New York 13, N. Y. (Walker 5-2200) • 3911 Wissahickon Ave., Philadelphia 29, Pa. (Baldwin 9-9900) • 50 Exchange St., Buffalo 3, N. Y. (Washington 2000) • P. O. Box 1267, Syracuse 1, N. Y. (Syracuse 73-5241) • Lyndhurst • Hartford • Rochester • Baltimore.*

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Bars	Plates	Pipe
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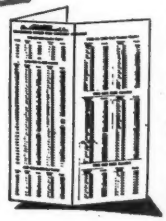
New Frasse Inventory of Straight-Chrome Stainless Steels

This latest Frasse inventory shows the straight-chrome analyses carried, and the quantity of each size that is available for immediate shipment. You'll find it handy for reference and a valuable purchasing guide. Send the coupon for your copy today.



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Peter A. FRASSE and Co., Inc.
17 Grand Street
New York 13, N. Y.

Gentlemen: Please send me your latest inventory of straight-chrome stainless steels.

*Name*_____

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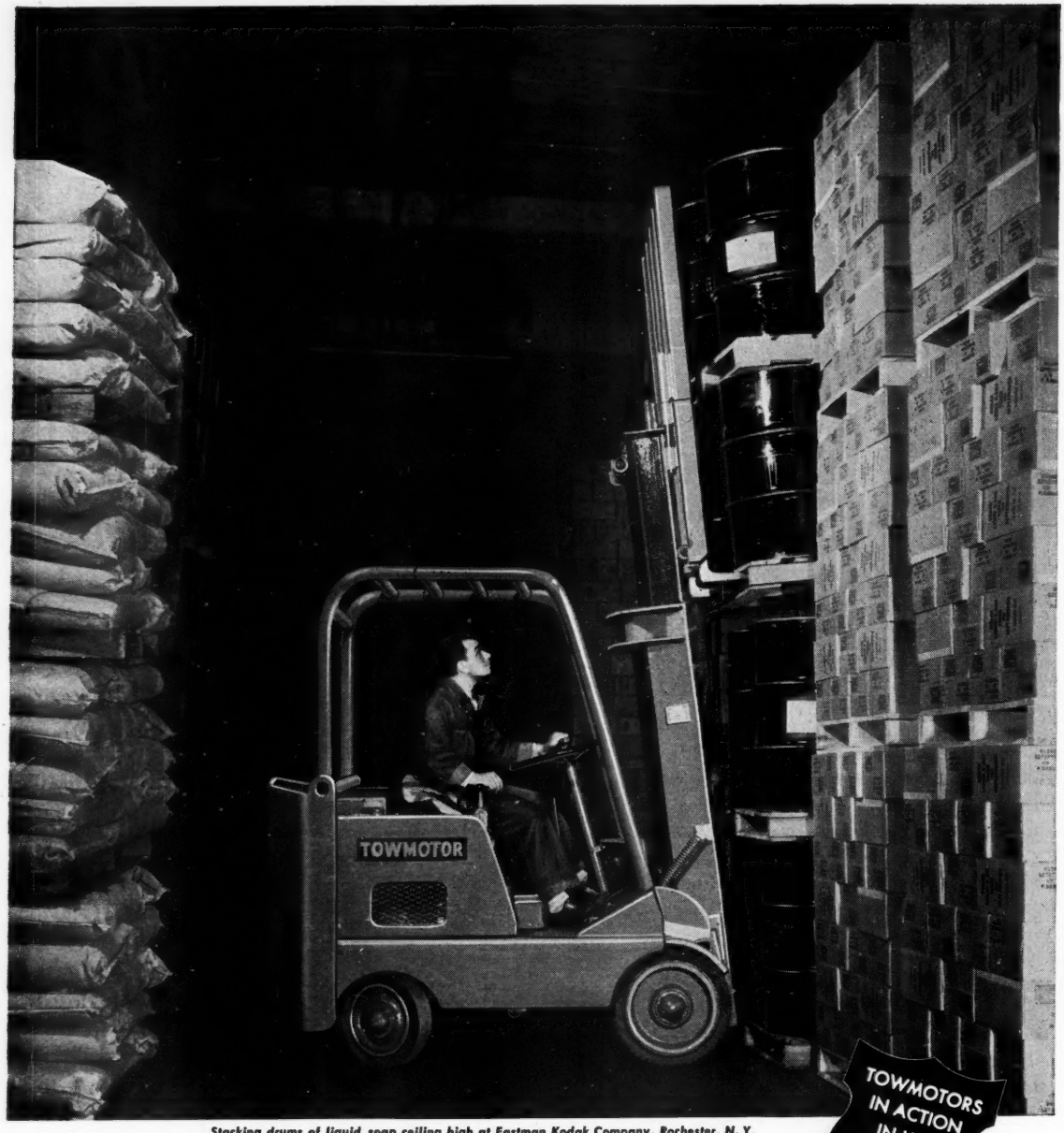
*Address*_____

Photo—Courtesy of National Aquarium Co.



Stacking drums of liquid soap ceiling high at Eastman Kodak Company, Rochester, N. Y.

TOWMOTORS IN ACTION IN U. S. INDUSTRY

use every inch...

stack to the roof, save space, double your storage area. You can do it easily, quickly, economically with a Towmotor fork lift truck. Towmotor handles all types of material. For the name of your nearest Towmotor Representative and a copy of Towmotor's tabloid size magazine on materials handling, write Towmotor Corporation, Div. 16, 1226 E. 152nd St., Cleveland 10, Ohio.

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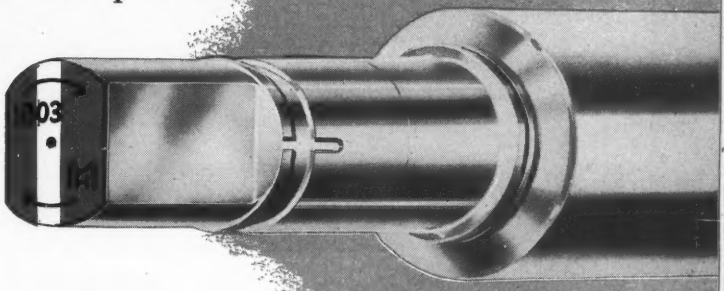
to modern hot strip rolling...

MACK-HEMP ROLLS *with the striped red wabblers* do a consistent job for the skilled hot strip mill operators who use them, because Mack-Hemp's engineers coordinate their roll research and development program with the demands of the mill operators.

As a result of this progressive policy, Mack-Hemp rolls *with the striped red wabblers* give a plus value to mill operations.



Because Mack-Hemp is always working to make each roll better than the one before—because Mack-Hemp keeps up with the latest developments in rolling mill practice, it's a good idea to keep your eye on what's new and different at Mack-Hemp.

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COMPANY
Makers of the Rolls with the Striped Red Wabblers
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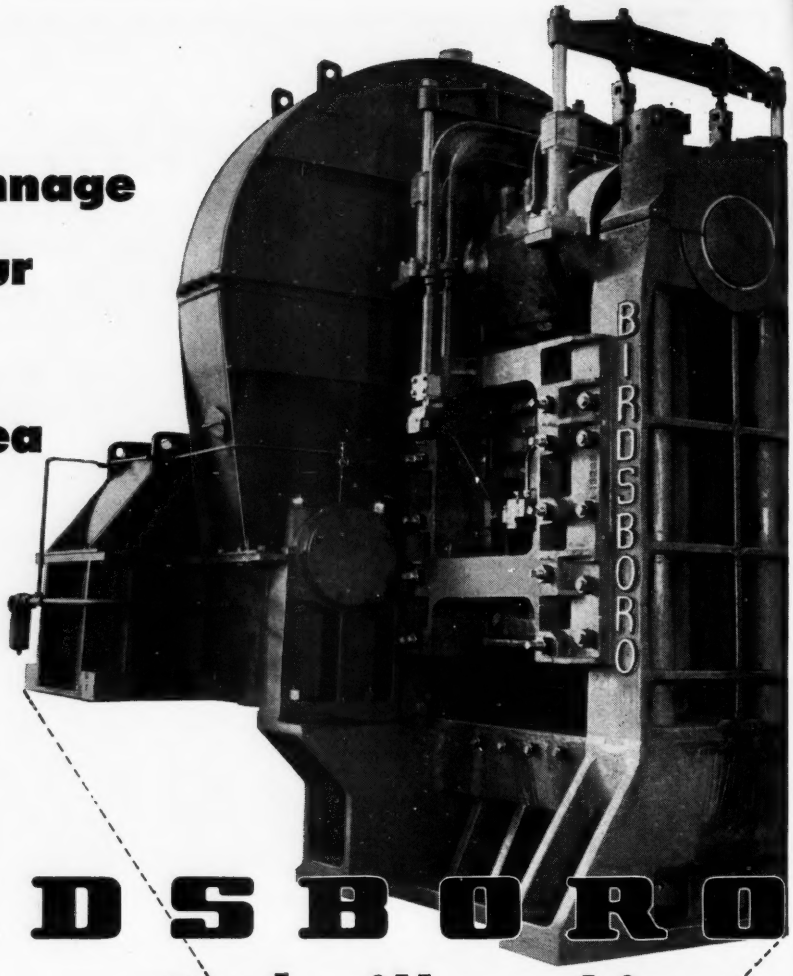
MACKINTOSH-HEMPHILL PRODUCTS INCLUDE: rolls . . . steel and special alloy castings . . . completely integrated strip mills . . . heavy duty engine lathes . . . Mackintosh-Hemphill rotary straighteners . . . improved Johnston patented corrugated cinder pots and slag-handling equipment . . . shape straighteners . . . end-thrust bearings . . . shears . . . levellers

For more tonnage from your present work area



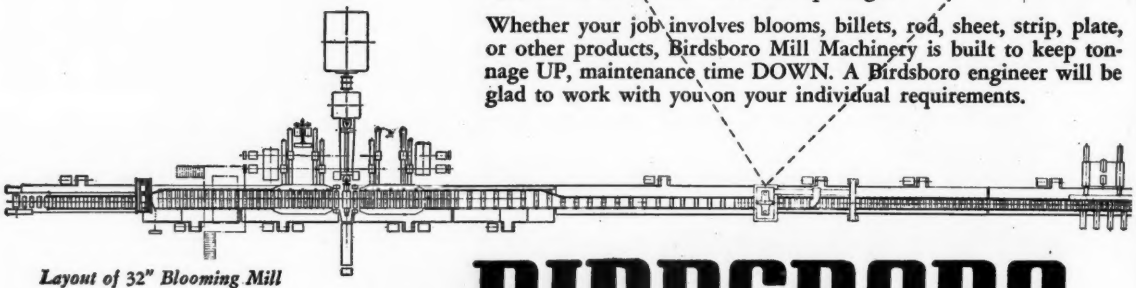
This Birdsboro Bloom and Slab Shear has been designed and built to handle the maximum production of a new 32" Blooming Mill installation.

BIRDSBORO

steel mill machinery

Getting maximum production from every foot of plant space is the demand of the day. And that calls for modern mill machinery that can work harder and stand up longer.

Whether your job involves blooms, billets, rod, sheet, strip, plate, or other products, Birdsboro Mill Machinery is built to keep tonnage UP, maintenance time DOWN. A Birdsboro engineer will be glad to work with you on your individual requirements.



Layout of 32" Blooming Mill

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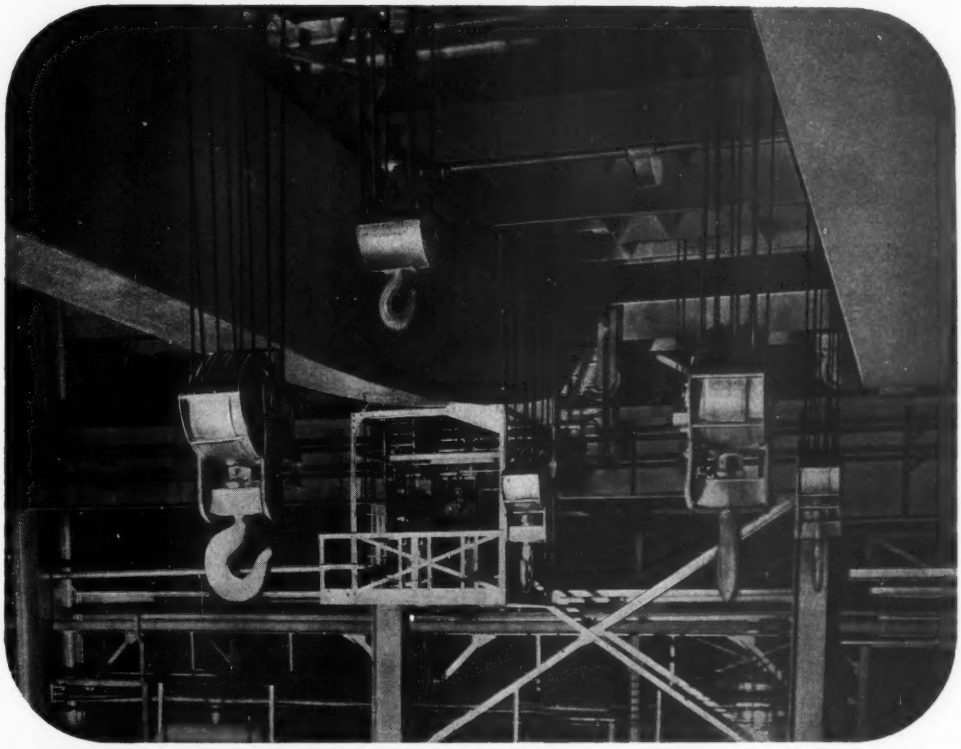

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ROEBLING is the best known name in wire rope. That's partly because we were the first wire rope makers in America. But more than that, we've always led in developing better wire and better rope for every purpose.

Today's Roebling Preformed "Blue Center" Steel Wire Rope is the plant man's best choice for efficiency and long life. This rope has *extra* resistance to crushing and abrasion... stands up under rough going. It saves you time and cuts costs.

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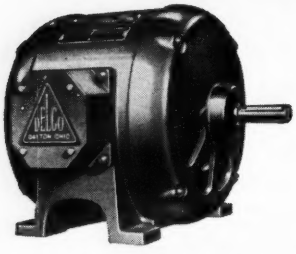
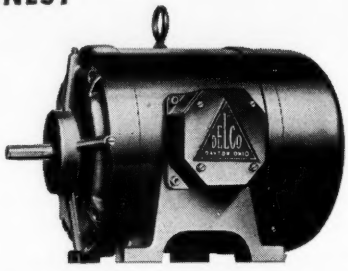


OPEN BALL-BEARING MOTOR

TOTALLY ENCLOSED FAN-COOLED MOTOR



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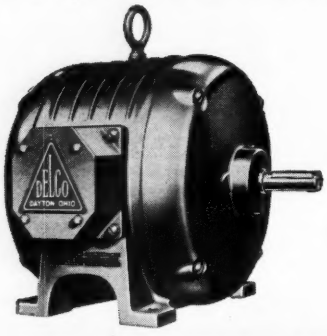
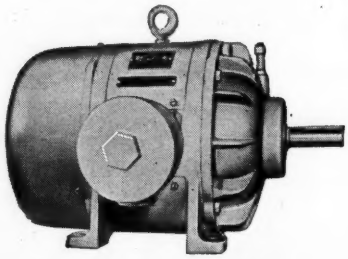


TOTALLY ENCLOSED MOTOR

EXPLOSION-PROOF MOTOR



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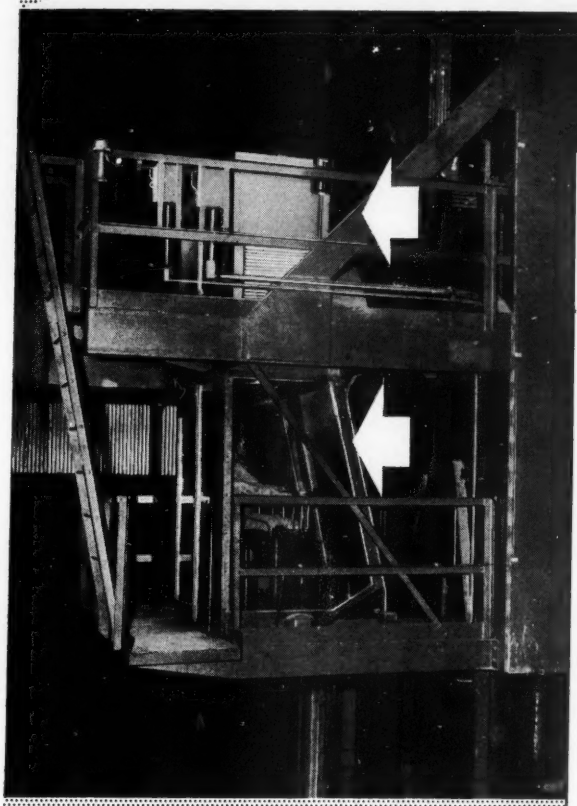

NOW
60° F. cooler inside
for this stripper crane operator at Ford Motor Company

MAJOR WORKING HAZARD ELIMINATED FOR RIVER ROUGE PLANT CRANE OPERATORS

Extreme temperatures up to 140° F. around stripper cranes like this one at Ford Motor Co. limit an operator's working endurance. Dravo Crane Cab Coolers are designed to lower the cab temperature to 80° F. providing operators with greatly improved working conditions. Not only is the crane operator's health safeguarded but his alertness and efficiency are much increased.

CRANE CAB COOLERS HAVE LONG SERVICE LIFE, PROVIDE YEAR-'ROUND AIR CONDITIONING

Dravo Crane Cab Coolers are ruggedly constructed, factory assembled and pre-tested to provide years of more-than-satisfactory service. All equipment in the unit is readily accessible with ample space for quick and efficient maintenance.

In the various air conditioning functions the crane cab cooler not only filters the air, removes dust, dirt and fumes, but heats the cab in winter, cools it in summer and provides constant ventilation the year around.

AVAILABLE IN SINGLE UNIT OR IN SPLIT-TYPE UNIT: IMMEDIATE DELIVERY

Dravo Crane Cab Coolers are built in two models—the self-contained unit, mounted on any available space on the crane, and the new split-type unit where the condenser section is mounted on the crane with the conditioning section in the cab.

The Dravo Crane Cab Cooler can be easily and quickly installed on any type of crane with a minimum of down-time required. Units are available now! Write for more information—or phone the nearest Dravo office and have our representative call on you. Dravo Corporation, 606 Dravo Building, Fifth and Liberty Avenues, Pittsburgh 22, Pennsylvania.

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NIAGARA

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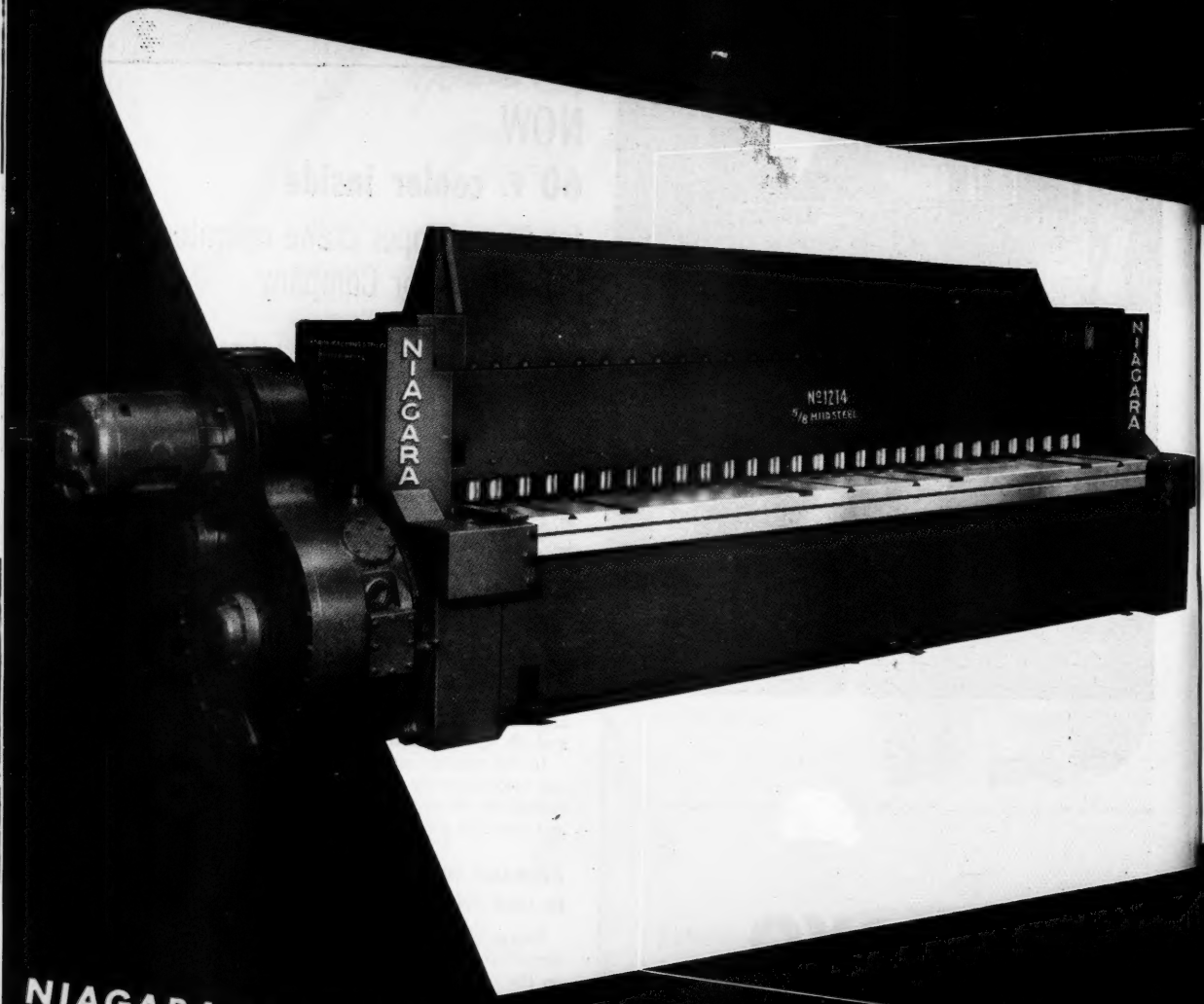

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...INE of UNDERDRIVE
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For Your Defense Production

- **Capacity from shim stock up to 1" thick steel**
- **Lengths 3 ft. to 20 ft.**
- **Any sheet material that can be sheared**

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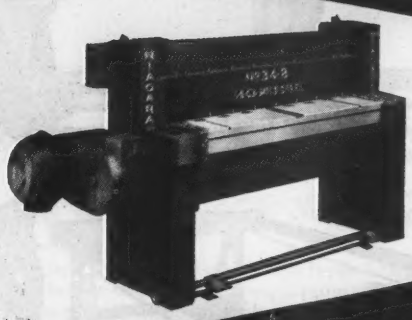

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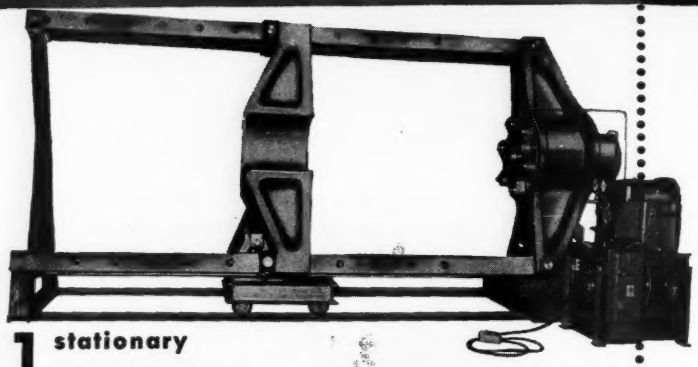
which of these

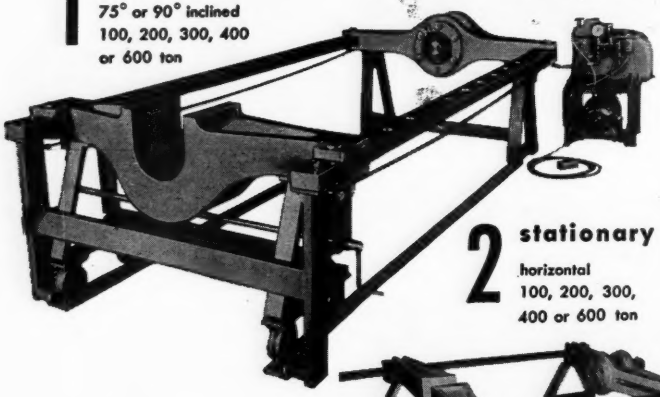
forcing presses

will do *your jobs* best?

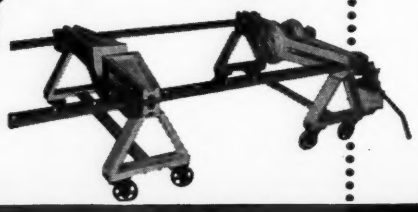
HYDRAULICS
Rodgers
KEEP THE WORLD MOVING



1 stationary
75° or 90° inclined
100, 200, 300, 400
or 600 ton



2 stationary
horizontal
100, 200, 300,
400 or 600 ton



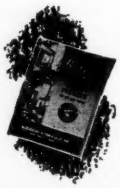
3 portable
100 or 200 ton

NO MATTER which size and type best meets your requirements for pressing, bending, forming or straightening, you'll get a press with all the design and construction features that insure finest operation and long service.

Rodgers line of versatile forcing presses have separate pumping units—choose from hand-operated or power-driven pumps . . . The hydraulic cylinder is removable from head member for servicing or for other use . . . Tracks, tension bars, abutment member and head member are all separate units to facilitate handling and erection of press . . . Presses with power pumps can be controlled from any desired location.

Get complete information and you'll see why Rodgers Forcing Presses are best for your type service jobs.

Send for New Catalog



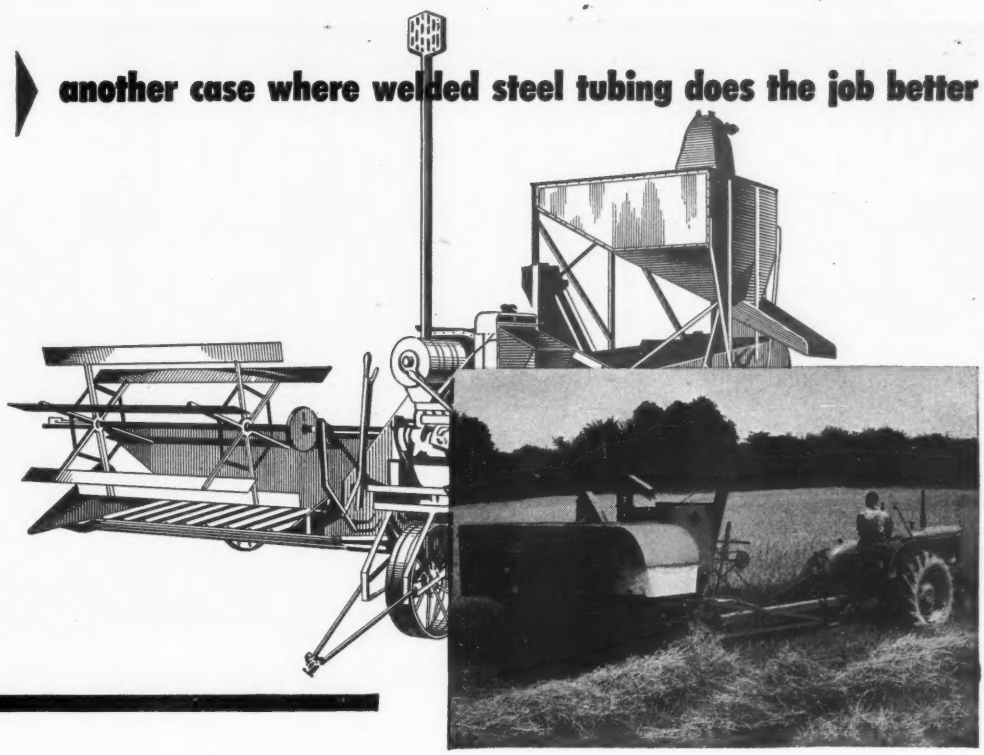
Rodgers Forcing Press Catalog No. 315A has 20 pages of descriptions and specifications on the complete line. Ask for your copy.

Rodgers Hydraulic, Inc.

7423 Walker St., St. Louis Park, Minneapolis 16, Minn.

HYDRAULIC POWER EQUIPMENT

another case where welded steel tubing does the job better



ELECTRUNITE Steel Tubing made this farm equipment better at lower cost . . .

it can do the same for you . . .

Unnecessary dead weight was lopped off in hundred-pound chunks without reducing strength when a leading farm implement manufacturer designed his line to use Republic ELECTRUNITE Steel Tubing at every possible point.

Strength and shock resistance were increased because Republic ELECTRUNITE Steel Tubing provided maximum strength per pound of metal over ordinary conventional shapes. Troublesome torsion and weaving of implements on rough ground was cut drastically . . . useful life of the implements was greatly lengthened, and maintenance reduced.

Does this give you some ideas about *your* product . . . whatever it may be? Republic ELECTRUNITE Steel Tubing can keep your product strong yet make it lighter, make it better at lower cost, more attractive to the man who uses it . . . and who buys it. We'd like to tell you our ideas.

REPUBLIC STEEL CORPORATION
STEEL AND TUBES DIVISION
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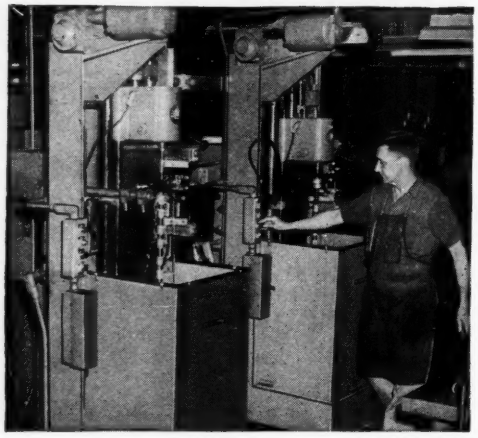
Republic STEEL
ELECTRUNITE TUBING

Made by the producers of ELECTRUNITE The "Original" ELECTRIC-WELDED BOILER TUBE

***FREE BOOKLET**—Write for Booklet SPD-52... contains data and case histories on ELECTRUNITE Tubing applications.*

WHICH OF THESE HEAT-TREATING PROBLEMS IS YOURS?

Westinghouse **RF** heating helped Saco-Lowell solve all six



Saco-Lowell Shops, makers of outstanding textile machinery, had always experienced problems with hardened bottom front rolls.

A Westinghouse 50 KW-450 KC RF Generator, with two standard vertical scanners, helped increase line production rates by 145% with total annual savings of $18,800.00. Direct labor costs have been cut 63%. Journal bearings are now ground after hardening, producing a higher quality roll. Formerly, every shaft required straightening; now this operation has been simplified and costs are reduced 70%.

Look at the results obtained by Saco-Lowell with a Westinghouse process that can handle 432 different rolls. Examine your heat treating problems. They, too, may be reduced, clarified, or eliminated entirely.

J-02243

Westinghouse Electric Corporation
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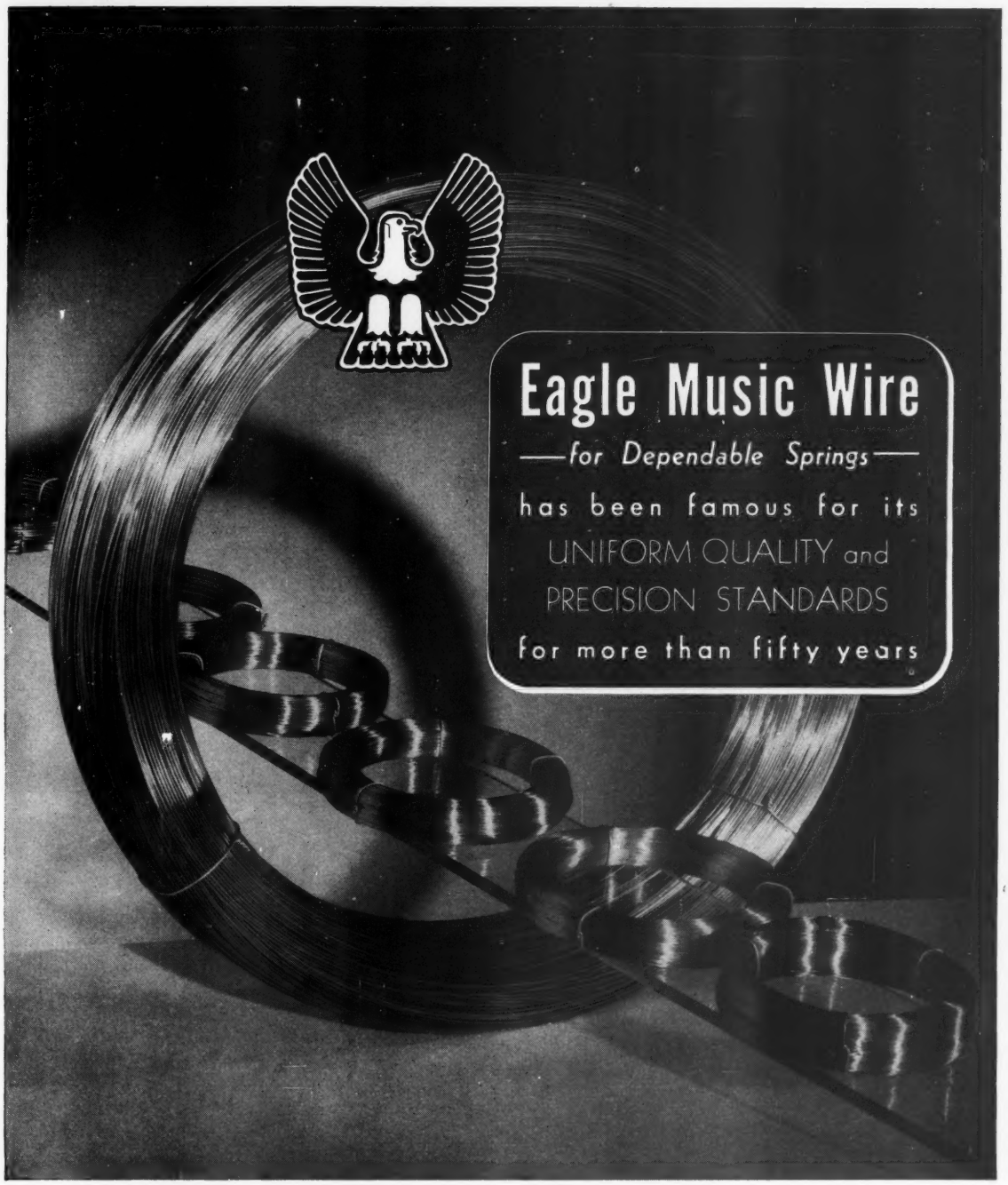
WESTINGHOUSE

INDUCTION HEATING



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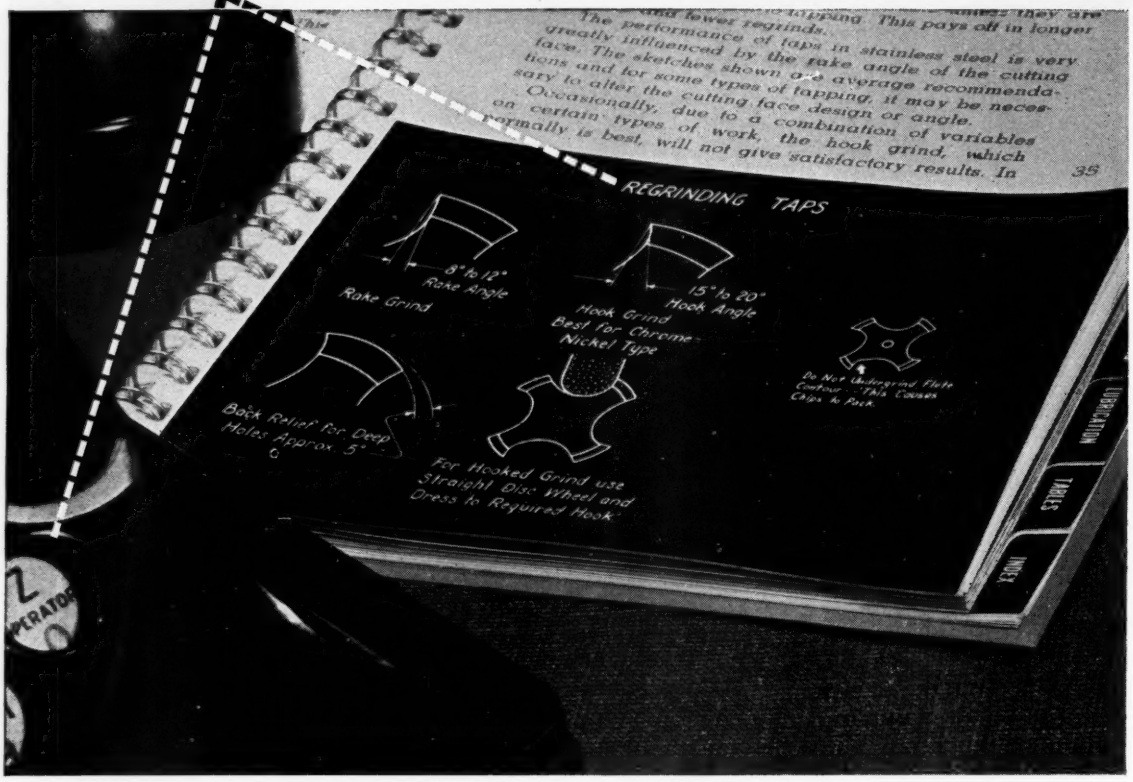
WASHBURN

CLEAN, UNIFORM BILLETS – STRIP – RECTANGULAR, ROUND, FLAT RODS
TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES

X MARKS YOUR ANSWERS


REGRINDING TAPS
8° to 12° Rake Angle
Rake Grind
15° to 20° Hook Angle
Hook Grind
Best For Chrome-Nickel Type
Back Relief For Deep Holes Approx. 5°
For Hooked Grind use Straight Disc Wheel and Dress to Required Hook
Do Not Undergrind Flute Contour This Causes Chips to Pack
LUBRICATION
TABLES
HOOK

to problems where you're TAPPING stainless

Let's face it. Even in the best plants, machining problems come up from time to time.

Maybe tapped holes aren't always accurate. Or taps may become dull too soon. The point is that you don't have to put up with difficulties on a Stainless tapping job. Or *any* Stainless machining job, for that matter.

More and more production men are finding a quick and sure way to get the results they want, in a hurry. They just pick up the phone and call the nearest Carpenter mill branch warehouse for personal help and printed information to solve specific problems. And it works.

It's what you might call a "Stainless Prescription Service". You name the problem and Carpenter works with you to find the answer. Try it today. The chances are that we can put our Stainless experience to work, to *your* advantage.

Shop notes on TAPPING stainless to help your men improve results and conserve stainless steel

IF TAP CUTS WHEN BACKING OUT... This is usually caused when tap cuts oversized hole, leaving no support for tap when backing out, thereby permitting it to cut. A "floating" tap holder or wobbly spindle contribute to this condition.

IF THREADS ARE ROUGH... If all other factors and variables have been carefully checked, try a negative grind on the heel of the tap. This overcomes tap tearing threads when backing out. Insufficient hook angle can also cause roughness in threads.

WHEN TAP RUNS HOT, DULLS... This invariably is due to tapping speed being too high. Check the chart in Carpenter's Notebook for recommended speed.

For more information on Tapping, use Carpenter's "Notebook on Machining Stainless Steels"

DON'T WAIT... COOPERATE!
The U.S. Needs Your Steel Scrap, Now

The Carpenter Steel Company, 139 W. Bern St., Reading, Pa.
Export Department: Carpenter Steel Co., Reading, Pa.—"CARSTEELCO"

Carpenter
more than corrosion resistance
STAINLESS STEEL
takes the problems out of production

This Tiny Tap Tells a Big Turning Story

This tiny part portrays better than words the extreme accuracy you can expect from a Monarch 10" Model EE Precision Toolmaker's Lathe. The operation detailed below was actually performed on a standard lathe which is employed primarily to turn a variety of parts for small, precision, automatic tapping and drilling machines for the user's own manufacturing operations. These master taps which he chases occasionally are needed to make a master die. This, in turn, is used to produce working taps in quantity. End use is tapping a hole in the end of surgical needles to permit holding of the suture.

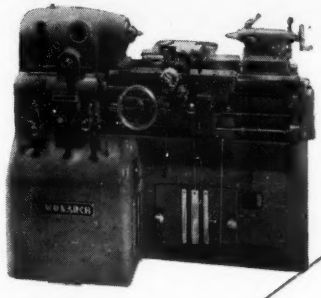
How surgeons thread the needles, we'll never know. We do know that in all probability you'll never have to work as fine as 200 threads per inch. But accuracy like this can be just as important to you, regardless. With the Monarch 10" Model EE, as a look at the listed features will at once reveal, you get a machine unequaled for precision, speed and sensitivity. Like most of the Monarch line of lathes, it can be furnished with "Air-Gage Tracer" controls . . .

The Monarch Machine Tool Company, Sidney, Ohio.

Surgical needle master tap—overall length, ¾"—diameter, .0218"—threads per inch, 200—thread accuracy, lead within .0001 over the entire threaded length of ⅜".

MONARCH 10" MODEL EE FEATURES

- All electric drive direct to spindle through multiple "V" belts. No gears in headstock.
- A true high speed lathe for small work. Available with speed range up to 40 to 4000 R.P.M.
- Totally enclosed, automatically lubricated end gearing and gear box.
- Flame hardened and ground ways for both carriage and tailstock. Bed all in one piece—no inserts.
- American standard Camlock spindle nose—for quick, rigid and accurate chuck and fixture mounting.
- Easy, fatigue-free operation. Base design permits operator to work close comfortably. He gets production—not backaches.
- Over 6000 10" Model EE machines in use.
- The only small lathe available with anti-friction bearing taper attachment.
- For thread chasing up to 100% faster, has exclusive combination of electric lead-screw reverse and variable reverse speed control.



Monarch

ACCURACY • ECONOMY • LONG LIFE

TURNING MACHINES

FOR A GOOD TURN FASTER . . . TURN TO MONARCH

THE MONARCH MACHINE TOOL CO., Sidney, Ohio

Gentlemen:
Please send me without obligation your complete illustrated Booklet #302, covering the 10" Model EE Monarch Sensitive Precision Toolmaker's Lathe.

NAME _____ TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

How do you Guide a Missile?

WHAT does it take to put a "brain" in a projectile —a "mind" that makes it know where to go, and when to explode? For that matter, how do you open garage doors and light the driveway at the beep of your horn . . . or throw out one faulty package from thousands in a food-packing plant?

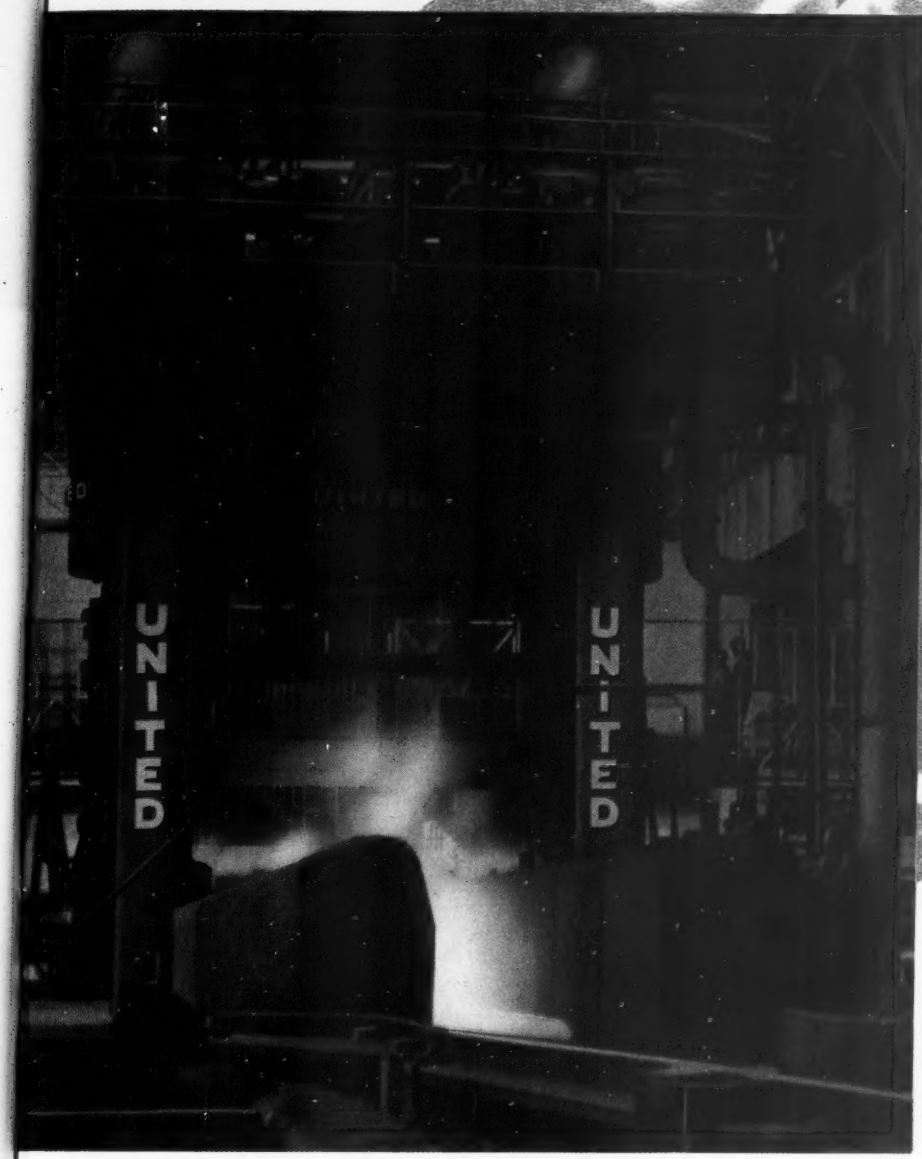
It takes special metals for such miracles—high-alloy steels and special magnetic materials of the types in which we have pioneered and are today leading producers. For any job which requires something more than ordinary steels can give you, look first to the *Allegheny Ludlum Steel Corporation . . . General Offices: Oliver Building, Pittsburgh 22, Pa.*

PIONEER in Specialloy Steels

Allegheny Ludlum

WAD 3975

AL
TIME-TESTED STAINLESS STEEL



45" X 115" SLABBING MILL

UNITED MILLS

the world over—
wherever steel is
rolled

UNITED

ENGINEERING AND FOUNDRY COMPANY

PITTSBURGH, PENNSYLVANIA

Plants at: PITTSBURGH • VANDERGRIFT • NEW CASTLE • YOUNGSTOWN • CANTON

Subsidiaries: ADAMSON UNITED COMPANY, AKRON, OHIO
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STEDMAN FOUNDRY AND MACHINE CO., INC., AURORA, INDIANA

Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other Heavy Machinery. Manufacturers of Iron, Nodular Iron and Steel Castings, and Weldments.

Call Ryerson

for Tested Alloy Steels

TOOL STEEL FROM RYERSON

Easier to Buy . . . Safer to Use

Steel procurement is trouble enough these days without adding unnecessary steps. That's one reason why many shops are ordering tool steel from Ryerson, their regular warehouse steel source. And with every shipment of Ryerson tool steel you get exact instructions on how to harden. Water, oil and air hardening types in stock—also ground flat stock.

Today, when Government restrictions are enforcing the use of leaner alloys with unfamiliar heat treatment response, you'll find Ryerson Alloy Service more helpful than ever. The tests we make to assure quality, verify analysis and guide your heat treating are your best protection against production difficulties, costly breakdowns.

For example, we spark test our alloy stocks to guard against mixed steels. And we put every heat of Ryerson as rolled and annealed alloy through four separate hardenability tests. The result: positive hardenability knowledge of the particular steel shipped to you.

All test information—hardenability, analysis, etc.—is carefully recorded on a Ryerson Alloy Certificate delivered with your steel as a guide to heat treatment. So don't take today's alloys for granted. Order from Ryerson by hardenability as well as analysis—and be doubly sure.

Stocks include low, medium, and high carbon alloys in all finishes and conditions.

PRINCIPAL PRODUCTS: CARBON, ALLOY & STAINLESS STEELS...BARS, STRUCTURALS, PLATES, SHEETS, TUBING, ETC.

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CINCINNATI • CLEVELAND • DETROIT
PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

May 26, 1952

Defense Business: Still Climbing

Deliveries of military equipment will climb to about $10 billion a quarter by the end of this year. Of the $94 billion available to date for military expenditures, about $71 billion has been obligated to procurement contracts with industry and in orders to government arsenals and shipyards. We will reach peak defense production by the end of this year and output at that rate will continue on through 1953 and 1954—with the exception of jet aircraft and medium tanks. Production of those two weapons will be increased as much as possible; by the end of 1952, jets will be turned out at a rate twice that of the previous year.

$32 Billion for 1952 Construction?

Outlays for new construction in 1952 may set a new record of more than $32 billion. That will be about $1 billion more than the revised 1951 total, reflecting largely increased expenditures for military and atomic energy facilities. Private investment exceeding $21 billion in new construction will vary little from last year's total, but public outlays amounting to nearly $11 billion will show an increase of $1.6 billion, or 17 per cent, over 1951. That prediction, made by the Departments of Commerce and Labor, is based on the assumption that no prolonged production stoppages will occur in the steel or copper industries.

Price Relief for Foreign Copper

On June 16 producers of brass mill and copper wire mill products will be able to add to their ceiling prices 80 per cent of the cost of imported copper in excess of 27½ cents a pound. The reason for the OPS order is the May 8 suspension of the agreement with Chile whereby U.S. users were guaranteed large tonnages of the red metal at 27½ cents a pound. The move is designed to encourage more imports of copper even if the cost is high. Comparable treatment will be provided for other primary users of refined foreign copper. NPA will allocate the foreign copper to even out its distribution.

Titanium Demand Soars

The demand for titanium is rising markedly, principally from aircraft engine builders. Fairly large contracts are about to be placed by the Air Force with engine builders who will be using titanium components. Tests of the metal in engine parts have worked out well.

Restricting Interpretation

The Defense Department is continuing its restrictive interpretation of the price redetermination amendment to the First War Powers Act. That legislation was intended to give relief for small firms which have suffered financial hardships in performance of defense contracts resulting from post-Korea price rises. Assistance granted by the Defense Department appears to be based upon the relative essentiality

Production-Engineering News—p. 75 *The Market Outlook—p. 151*

of the producer to the national security. Under the "essentiality" interpretation, small business has trouble getting help.

Financing: Iron Ore Headache

Lake Superior iron ore producers have financing problems. They must do more underground mining, remove heavier overburdens for open-pit mining and build big plants to process taconite. All that costs money, and the difficulty is to get it on reasonable terms. The Lake Superior Iron Ore Producers Advisory Committee discussed that problem with the Defense Procurement Materials Agency, and federal help may be forthcoming.

Strong Pressure on Rails

The government applied strong pressure to end the three-year rail dispute, partly to relieve or divert the heavy criticism leveled at it about seizure of the steel industry. The 21-month federal seizure of the railroads ends as a result of the settlement. More than 150,000 members of the engineer, fireman and conductor brotherhoods will get an immediate wage boost ranging up to 37 cents an hour and lump sum payments of $600 to $1100 for back pay to October, 1950. Back wages will cost the roads an estimated $100 million.

Locomotive Formula Hit

Under attack is the formula used by NPA in allocating controlled materials to the diesel-electric locomotive industry. General Motors Corp.'s Electro-Motive Division has complained to the NPA Appeals Board, and trouble is brewing. Electro-Motive argues that it has expanded its capacity three times as much as the rest of the industry, but much of that has occurred since the base period of 1948-1950 which is used to figure what proportions of total industry output each company should produce. So, Electro-Motive can't use all its new capacity and has had to lay off 1500 employees.

Straws in the Wind

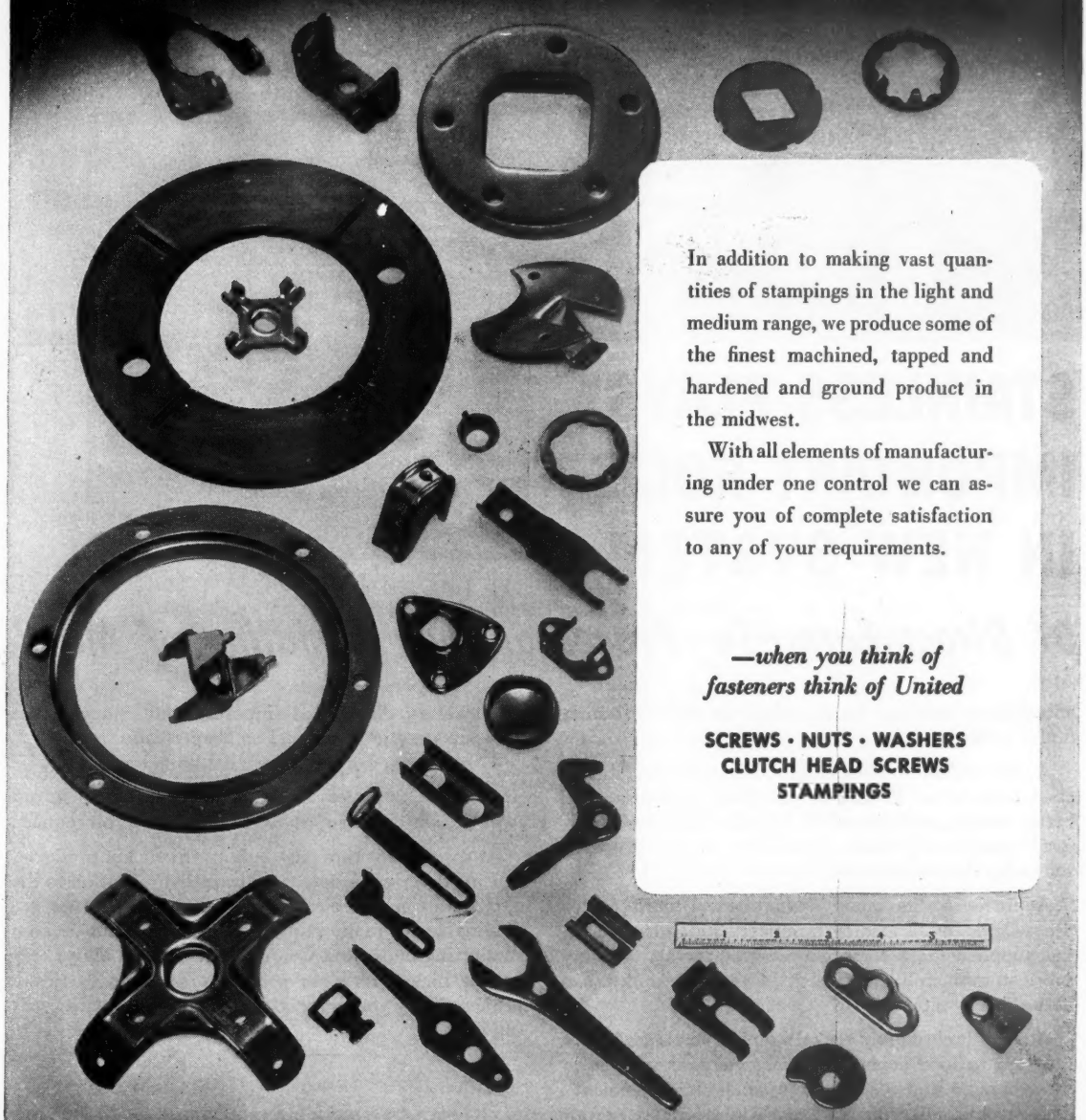
Users of steel cans and drums report that for the first time in ten years shippers no longer require a deposit for the container . . . International Harvester Co. has laid off 432 people at Ft. Wayne, Ind., because of declining demand for medium and heavy trucks . . . The lone important producer of soapstone in the U.S. can't meet demands, and a lot of industrial laboratory counter tops are having to use makeshift substitutes.

What Industry Is Doing

We find ourselves this year at the crossroads between free enterprise and state socialism, American Iron & Steel Institute members were told (p. 47) . . . Warehousemen are now preparing for a buyers' market (p. 49) . . . You may be able to cut production costs with rapid-reversing motors (p. 50) . . . Lifting of installment curbs hasn't yet brought substantial increases in sales of most civilian durables (p. 51) . . . Lone Star Steel Co. postpones construction of 1200-ton blast furnace after it is refused a 100 per cent tax write-off on it (p. 58) . . . Present easing of materials controls may be partly washed out if more industry strikes materialize (p. 59).

UNITED STAMPINGS

from our Pressed Products Plant



In addition to making vast quantities of stampings in the light and medium range, we produce some of the finest machined, tapped and hardened and ground product in the midwest.

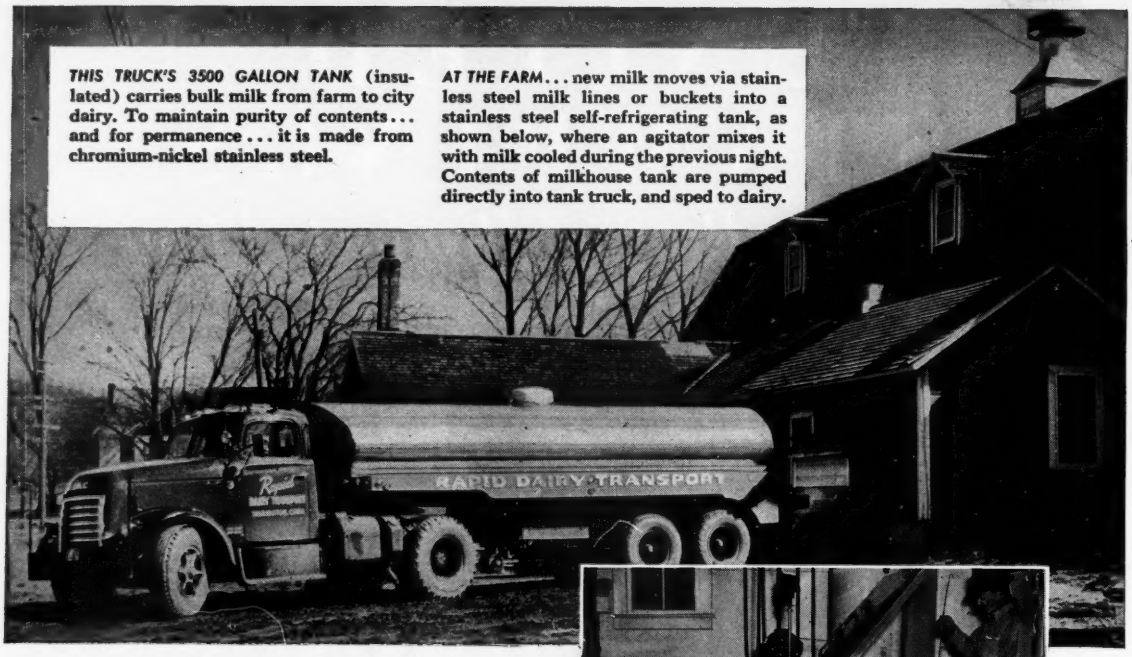
With all elements of manufacturing under one control we can assure you of complete satisfaction to any of your requirements.

—when you think of fasteners think of United

SCREWS • NUTS • WASHERS
CLUTCH HEAD SCREWS
STAMPINGS

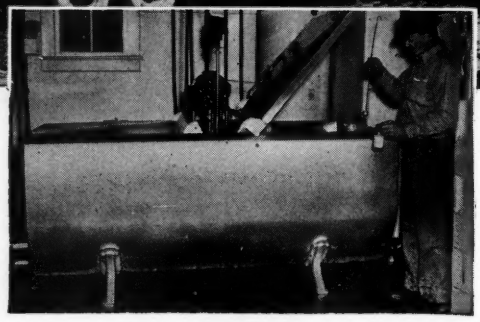
United Screw and Bolt Corporation

Chicago 8 Cleveland 2 New York 7



THIS TRUCK'S 3500 GALLON TANK (insulated) carries bulk milk from farm to city dairy. To maintain purity of contents... and for permanence... it is made from chromium-nickel stainless steel.

AT THE FARM... new milk moves via stainless steel milk lines or buckets into a stainless steel self-refrigerating tank, as shown below, where an agitator mixes it with milk cooled during the previous night. Contents of milkhouse tank are pumped directly into tank truck, and sped to dairy.



STAINLESS PLAYS IMPORTANT ROLE IN NEW SYSTEM

Of Direct Farm-To-Processor Bulk Handling of Milk!

"Something *new* has been added" to the six billion dollar milk industry...

A *new system*... in which chromium-nickel stainless steel contributes to quicker handling, less drudgery, better cooling, and above all, to higher and more uniform quality of product. Simplicity of the system is shown by the illustrations.

Appreciating its many advantages, United States Steel Company, a leading producer of stainless steels, has supplied these corrosion-resisting metals to many fabricators of milk tank trucks, farm bulk milk tanks and allied equipment.

Austenitic chromium-nickel stainless steels are highly resistant to food acids and atmosphere, as well as to most organic and a great many inorganic chemicals. The mechanical properties of stainless steels permit cutting bulk and deadweight without sacrificing strength or durability. Another all-important advantage is that they are easy to clean, and to keep clean.

Leading steel companies produce austenitic chromium-nickel stainless steels in all commercial forms. A list of sources of supply will be furnished on request.

At the present time, the bulk of the nickel produced is being diverted to defense. Through application to the appropriate authorities, austenitic stainless steels are obtainable for many end uses in defense and defense supporting industries. Counsel and data on alloys containing nickel, for your present production or future projects, are yours for the asking. We invite your inquiries.

EMBLEM OF INCO SERVICE

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK 5, N. Y.

It's Your Fight, Too

At dozens of industrial conventions this spring, the No. 1 topic has been the government's seizure of the steel mills and the implications of that action. Too many industry people regard this as a contest between big steel on the one side and big labor and big government on the other. Actually, the issue is much broader.

The steel mill seizure culminates a trend of almost two decades in which we have marched, under government direction, through a growing array of symptoms toward actual manifestations of national socialism. Government today may make more decisions about business than do businessmen. Government tells business how much raw material it can have, what and how much it can produce, how much it must pay its workers, what prices it can charge and how much profit it can retain. The only complete responsibility left to management is for losses.

Government controls over business and incursions into management touch all businesses—large, medium and small. They affect all consumers by negating the benefits of free, competitive enterprise. They affect all workers, as even many disenchanted unionists now realize.

If the government can seize the steel mills to enforce its whims in that industry, it can just as well seize the forging shops, the foundries, the machine tool plants or any other segment of the metalworking industry. It can seize the communications industry. It can seize any business enterprise. What happened to steel can happen to you.

In this realization, many thoughtful metalworking men regard 1952 as the year of the big decision: Shall we continue on the road toward statism? Or shall we redirect our national politico-economic philosophy to create a climate in which initiative and enterprise will flourish and a system that will provide proper incentives and freedoms? Shall we abandon government of emergency, by emergency and for emergency to return to government of, by and for the people?

While the courts will decide the legality of the steel mill seizure, the larger decision will be made by the people.

Don't let your neighbor bear the brunt of the battle alone. It's your fight, too.

Walter J. Campbell

MANAGING EDITOR

MAKING PARTNERS: Two weeks ago the comment was made in these columns that despite large expenditures of money and the employment of outstanding specialists, industry had not yet found a formula for public and employee relations that really clicks. A number of readers insist they have found such a formula.

Several medium-sized companies report that instead of giving Christmas or other bonuses in cash they give employees common stock in "blue

chip" corporations. For example, Automatic Screw Machine Products Co., Chicago, has been distributing U. S. Steel common for the past several years.

"It doesn't take much imagining to realize how our employees feel about the steel seizure," says John Norman, vice president. "They've come to look on U. S. Steel as they do their bank accounts. It is their own property."

Making partners of employees by encouraging them to become part owners of business enterprise makes a lot of sense. Anything that adversely affects industry adversely affects the pocketbooks of these new capitalists. They're aware of it, too.

* * *

DISCONCERTING: The lifting of Regulation W, the credit control for consumer durable goods, is not having the salutary effect on sales that some critics of the regulation claimed the action would have (p. 51).

The turn of events should not be surprising. Business is leveling off, even declining in consumer durables. The action of lifting a credit curb is essentially a negative move, and no negative step can be expected by itself to be a powerful stimulant to sales for long.

The disconcerting feature of the business is that many people publicly argued that the removal of curbs would mean more sales. That argument isn't panning out and gives ammunition to government planners who can say with seeming logic: "Why the complaints about federal controls hurting business? The situation with Regulation W doesn't bear that out."

Controls do hurt business, but their removal does not necessarily stimulate activity if the general economic climate at the time of removal is unfavorable. A far sounder argument for removing controls is this: Restrictions on the economy in the long run erode away profits, throttle desire for progress and dim the wish for freedom. When it's reasonably clear that controls no longer are needed for the temporary purpose for which they were designed, let's get rid of them.

* * *

CHALLENGE: Indications are on all sides that we're near a turning point in our business affairs (p. 65).

The sentiment at the meetings of both the steel warehousemen and industrial distributors suggests we are on the threshold of a buyers' market in many metalworking lines (p. 49). To one softened by more than a decade of easy living, that may be alarming economic news.

It should be challenging to efficient producers, holding the promise of greater competitive advances for those companies than possible at almost any other time in the past ten years. For the uneconomic, marginal outfits have eaten high on the hog in the past era of plenty, feasting often on markets that you helped create in harder times. You have the chance to show your strength now. By sound business practices, good research, shrewd salesmanship and hard work you soon will be able to make more real progress in relation to less aggressive competitors than at any time since the beginning of World War II.

* * *

MATERIALS BEFORE SPEED: Some practical considerations are keeping aircraft designers from plunging their heads too far into the clouds. A down-to-earth areonautical engineer points out (p. 77) that predicted missile and airplane speeds of 2500 mph are far from realization. They won't be reached until new structural materials are developed to withstand the severe operating conditions anticipated. Present metals are not equal to the job. At sustained high speeds twice the speed of sound at about 40,000 feet, for instance, tough aluminum relaxes and loses much of its strength. Today's cockpit canopy material achieves a putty-like consistency.

* * *

FOREIGN AID: Industrial countries the world over have been trying for 25 years to perfect a method for hot extruding stainless and other high temperature alloys. A French concern, Acieries Electriques d'Ugine finally did the job, using solid glass as the lubricant.

The Ugine-Sejournet hot extrusion process, described (p. 98) by Jerome Strauss at last week's American Iron & Steel Institute technical session, produces bars, shapes and tubes on 600 to 1650-ton presses. Major import of the method: Steels and other highly alloyed materials that cannot be rolled at all, or are extremely difficult to roll, now can be converted economically into desired forms. Future of the process in this country looks bright. Licensees who have built or are building special hot extrusion facilities are Babcock & Wilcox, United States Steel, Allegheny Ludlum, Jones & Laughlin.

YOU MAY save 3.15 POUNDS PER SHEET*

WITH

MicroRold®

STAINLESS STEEL

When you order sheet by gauge number the permissible A. I. S. I. variation in thickness is plus or minus 10%. Thusly, if you order 18 gauge, you may receive a sheet .052 thick when .0475 would suit your purpose. Using a standard 18 gauge 36″x120″sheet as an example, the theoretical weight is 63 pounds, but this weight could permissibly vary between 65.52 pounds and 59.22 pounds.

A sheet of MicroRold .0475 thick with a tolerance of only 3% would weigh 59.85 pounds thus insuring a saving of 3.15 pounds from the theoretical average-weight, or 5.67 pounds from the maximum, while still remaining within the 18 gauge ordering range.

Weight of One Sheet of 18 Gauge 36″ x 120″ Plus or Minus 10%

.052″—65.52 Pounds	
.051″—64.26 Pounds	
.050″—63.00 Pounds	Theoretical Wt.
.049″—61.74 Pounds	63.00 Pounds
.048″—60.48 Pounds	
.047″—59.22 Pounds	

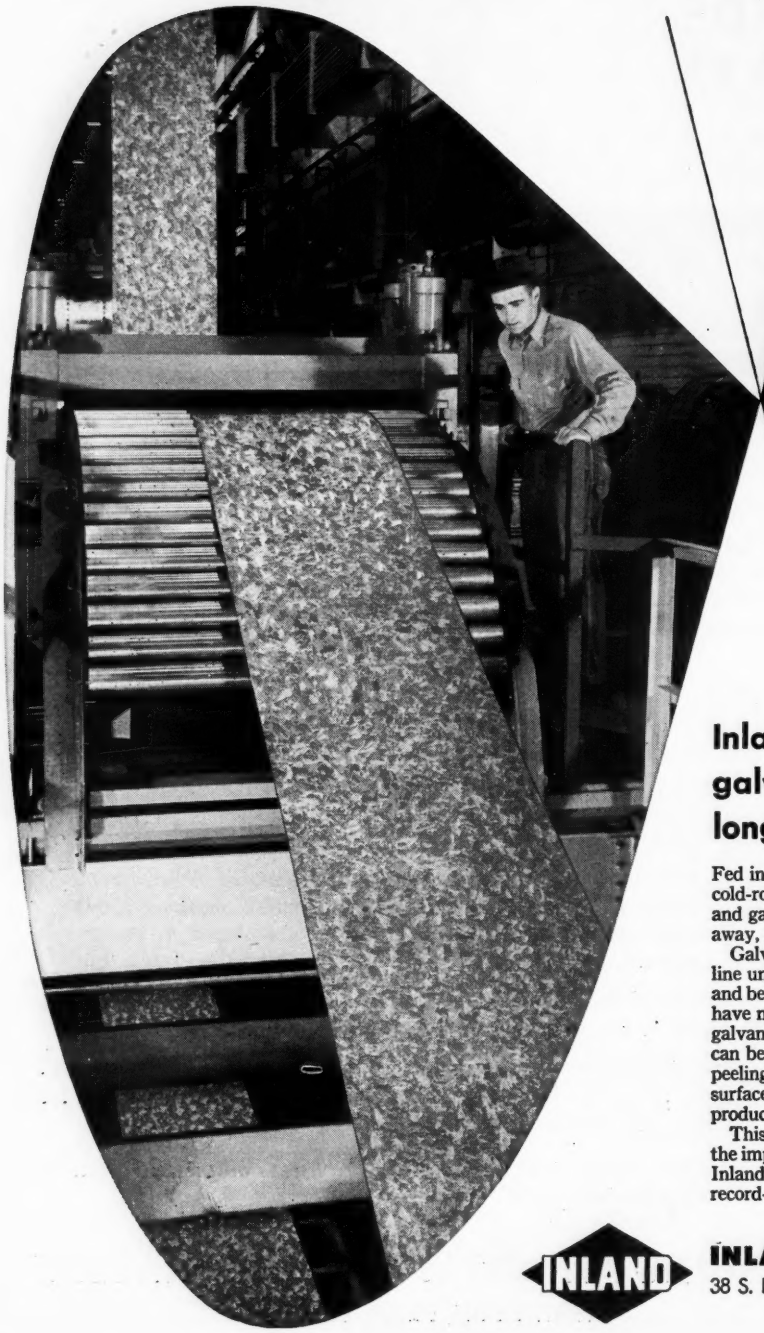
Weight of the same size sheet of .0475 plus or minus 3% is 59.85 pounds with an average saving of 3.15 pounds per sheet.

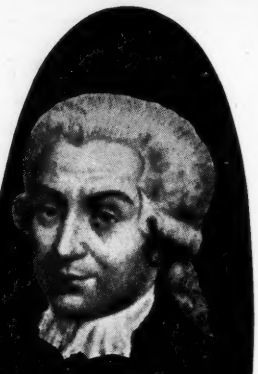
Multiply this saving by the number of sheets you use per month and the price per pound and you have a good dollar and cents reason for buying MicroRold.

** Each additional 1/1000″ of thickness adds 1.26 pounds weight per sheet.*

WASHINGTON STEEL CORPORATION
WASHINGTON, PENNSYLVANIA

"Old Luigi Galvani* would certainly get a shock out of this!"





*Luigi Galvani—1732-1798. Famous physicist who discovered the process of generating electricity chemically. Father of Galvanizing process.

Inland's new continuous galvanizing line . . . the longest in the U. S. A.

Fed into this new galvanizing line, cold-rolled strip is flame-cleaned, annealed and galvanized. It emerges a full city block away, cut to length or coiled.

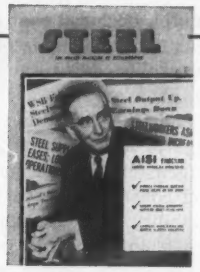
Galvanized steel sheets produced on this line under the patented Sendzimer process, and bearing Inland's trade mark, TI-CO, have no brittle iron-zinc layer like ordinary galvanized sheets. That's why TI-CO can be severely formed without flaking or peeling. And TI-CO's bright, smooth surface increases sales acceptance of products fabricated from it.

This new galvanizing line is another of the improved steel-making facilities that help Inland to produce better quality steels in record-breaking quantities.

INLAND

INLAND STEEL COMPANY
38 S. Dearborn St. • Chicago 3, Illinois

Crossroads: Statism or Freedom?



Steel men see 1952 as year of decision. Industry, courts and voters must decide between subjugation and liberation. Issue provides management "its greatest challenge"

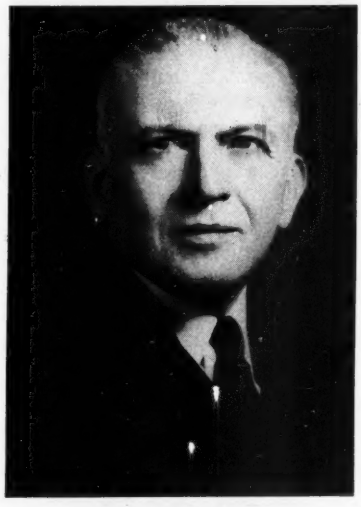
WILL 1952 be the year in which the fate of private enterprise is decided? Will it be the year in which will begin industry's final subjugation to the joint forces of dictatorial government and ambitious labor leaders? Or will it be the year in which we begin our liberation from the tyrannies to which industry has been subjected for more than a decade?

These were the sobering questions posed to 1200 top steel executives May 21 and 22 at the 60th general meeting of the American Iron & Steel Institute in New York.

To Be Decided—The answers lie in the future. Specifically, they hinge on the decision of the Supreme Court in the steel seizure case and on the verdict of the American voters next November.

Meanwhile, the steel men are profoundly disturbed by the incursions of recent months and the portent they may hold for the future.

Bargaining Out — Surrender by the government to the pressure of labor unions has brought a practical end of collective bargaining, as long as the present political regime survives, said Walter S. Tower, retiring president of the Institute.



EDGAR C. BAIN
. . . to explore new ways

BEN MOREELL
. . . management must do more

"Collective bargaining may now be defined as capitulation by the employer. Why would any leader of a powerful national union seriously bargain with private management when the government will intervene if given any plausible pretext whatever? Government has proved that it will give more than unions dared ask, even to the extent of confiscating company profits for that purpose."

Risk of Ruin—Mr. Tower lashed out at the "outlaw seizure of steel plants;" the "tyranny of labor union monopolies;" the "perversion of economic facts about steel wages, prices and profits for obvious political purposes;" the "constant harping about shortage of steel supply;" and the "growing array of symptons and actual manifestations of national socialism."

He warned that present government policies toward wages, prices and profits—which are inseparable—carry the risk of ruin for some steel companies.

Commitments for expansion programs run into tens of millions of dollars even for the smaller companies. Large chunks of borrowed capital are involved. If expansions are not finished, the facilities cannot be operated. The company is stuck. If finished and not operated at a fair profit because of wage boosts and price freeze, the company is also stuck.

"Who," asked Mr. Tower, "pushed the companies into expansion programs?"

Controls Unnecessary — Mr. Tower holds that controls over steel are unnecessary. Out of the industry's huge production of steel the "small part required for military needs could have been assured, without official fingers being thrust into every corner of the industry."

The defense program has "paved the way for more open partnership of labor and government, for more federal controls, and for small minds to toy with the big problems of the steel industry—this industry which has always been the chief reliance of the nation whenever the going gets rough."

Who Scuttled Stabilization—"To epitomize this whole sequence of events," Mr. Tower continued, "what could be more significant than the recent contrasts of attitudes toward the matter of wage and price increases as inflationary factors? Steel men urged a hold-the-line policy of no increase either of steel wages or of steel prices. Official action rejected that sound position and insisted on wage increases larger than before as a further step in government-sponsored inflation. Wage stabilization was scuttled."

Challenge to Management—Admiral Ben Moreell, chairman, Jones

& Laughlin, declared that management has not done enough to "keep us from going down the road to statism at a rapidly accelerating pace" and that therein lies the challenge to American business.

Management, he said, has shown real and constant growth in social responsibility and has done a wonderful job in the area of better goods for more people at lower cost. But if the statism trend is to be reversed there must be more to the leadership of American business than the creation of wealth, production and distribution of goods and services.

This leadership, he declared, must be based "upon the same traits which we admire in individuals — strength, vigor, courage, honesty, tolerance, understanding, humility and high character."

More Selective—The steel industry will be a lot more choosy in the next few years on what, where and how it builds, declared William M. Akin, president, Laclede Steel Co., St. Louis.

The next generation of steel executives, when it pays off bonds for present expansion, the speaker said, may wonder why $2 was spent where $1 would have done.

Mills of the future, Mr. Akin asserted, will not roll as much per hour but they will be more flexible, and comparable on costs, with lower fixed charges. Fixed charges will remain, despite accelerated depreciation.

The biggest opportunity and the greatest job of the steel industry in the next generation, Mr. Akin continued, is to learn to lead its own people. Only then will it reach its full potential, in earnings and other respects.

Goals of Research—The Charles M. Schwab Memorial lecture was delivered by Dr. E. C. Bain, vice president, U. S. Steel Co. His topic: "To Explore New Ways."

With the relatively meager domestic sources of alloying elements in sight, Dr. Bain believes a great national benefit would result from discovery of a means to impart to carbon steel the hardenability of the alloy steels, over and above that of boron. He suggests it might be worth offering a substantial prize for a means of "denucleating" medium carbon steel so it would not become pearlitic in large section upon faster cooling.

Materials in Combination—A probable trend in construction, suggests Dr. Bain, will be the use of combinations of different materials for maximum effectiveness at minimum cost.

Better ways to inhibit corrosion and extension into higher temperatures of the high strength of low-alloy steels provide long term goals for industrial researchers.

Medalists—John S. Marsh, research engineer, Bethlehem Steel Co., received the Institute medal for his paper, "Air Temperature in Open Hearth Operation," presented at the 1951 meeting. L. F. Reinartz, vice president, Armco Steel Corp., received the regional technical award for his paper, "New Departure in Steel Production," presented at the Chicago regional meeting and describing Armco's new method of charging scrap in the open-hearth furnace.

Tower Retires—Mr. Tower's retirement as president of the Institute became effective May 23. He will continue to serve in an advisory and consulting capacity.

Max D. Howell, vice president and treasurer, U. S. Steel Corp., will become executive director of the Institute.

Benjamin F. Fairless, chairman and president, U. S. Steel, and Frank Purnell, chairman, Yougstown Sheet & Tube Co., were reelected vice presidents. George Rose continues as secretary.

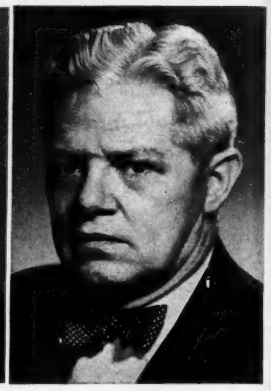
New directors include Robert S. Lynch, president, Atlantic Steel Co., Atlanta, Ga., and A. F. Franz, president, Colorado Fuel & Iron Corp., Denver and New York.

Digests of technical papers presented at Institute meeting start on page 88.

Chairmen at Technical Sessions

E. F. LUNDEEN
Inland Steel
(Open Hearth)

T. F. OLT
Armco Steel
(Research)



J. R. TRIMBLE
Tennessee Coal & Iron
(Processing)

AISI Medalists

JOHN S. MARSH
Bethlehem Steel
(Institute Medal)

L. F. REINARTZ
Armco Steel
(Regional Technical Award)

Steel Jobbers Get Set for Buyers' Market

At the warehouse meeting they're warned to prepare for changing conditions. Inventories rise, but they're still unbalanced and 40 per cent under 1949 levels

GOVERNMENT policies affecting the steel industry and return of the buyers' market were the corridor and formal discussion topics at the annual meeting of the American Steel Warehouse Association in New York last week.

The primary operating task of the warehouses in the months ahead will be to balance inventories; their No. 1 administrative assignment will be to prepare really to sell. While still enjoying a comfortable business volume, the distributors today, conscious of a change developing in their markets, are building policies aimed at meeting more competitive conditions.

On the Upgrade—Stocks of 112 out of 198 companies handling the bulk of industrial steel products distributed through warehouses were 1,115,408 tons, Sept. 1, 1949; 739,991 tons on Sept. 1, 1950; 407,800 tons on Sept. 1, 1951. Since then stocks have climbed—to 653,861 tons as of Apr. 1, 1952. That's an improvement but still 40 per cent below those on hand in 1949, and inventories remain badly unbalanced.

In 1951 the warehouses sold more than 18 per cent of total steel output to about 500,000 customers, a performance not expected to be continued once defense spending slackens off. That factor and two others have warehousemen giving a new look at their markets and facilities. The two additional influences are the increasing use of alloy and stainless steels and the mounting production of sheets and strip in coils instead of bundles. To cope with the latter development, many distributors are installing slitting equipment to cut coils to customers' specifications. More warehouses are also beginning to stock specialty steels.

Encroaching—Charles M. White, president of Republic Steel Corp., told the distributors that the government now makes more decisions about business than businessmen—and takes three times as much in taxes as the stockholders receive in dividends. In commenting on the steel wage-price case, he hit "government finagling" that costs the economy "$1 million per finagle."

Walter S. Doxsey, Cleveland, was re-elected president of the association, and Harold B. Ressler, Joseph T. Ryerson & Son Inc., Chicago was elected chairman of the executive committee. Other officers elected: J. J. Hill III, Hill-Chase & Co., Inc., Philadelphia, and Leland W. Browne, Gate City Steel Works Inc., Omaha, Nebr., vice presidents, and F. H. Lovejoy, Wheelock, Lovejoy & Co. Inc., Cambridge, Mass., treasurer.

J. A. PROVEN
. . . new president of ASMMA

A Way To Get Business

Makers and distributors of industrial supplies work out new sales training program

INDUSTRIAL supplies distributors are doing something about the tougher business conditions they hear are ahead. They are putting a new emphasis on selling and have worked out a new sales training program for the country's 15,000 industrial supplies salesmen.

A spot check of the 3000 manufacturers of industrial supplies and their distributors attending the annual conference at Atlantic City, N. J., last week of the American Supply & Machinery Manufacturers Association and affiliated distributor organizations indicated that business of this $4 billion industry still is exceedingly good, although it is 10 per cent under 1951.

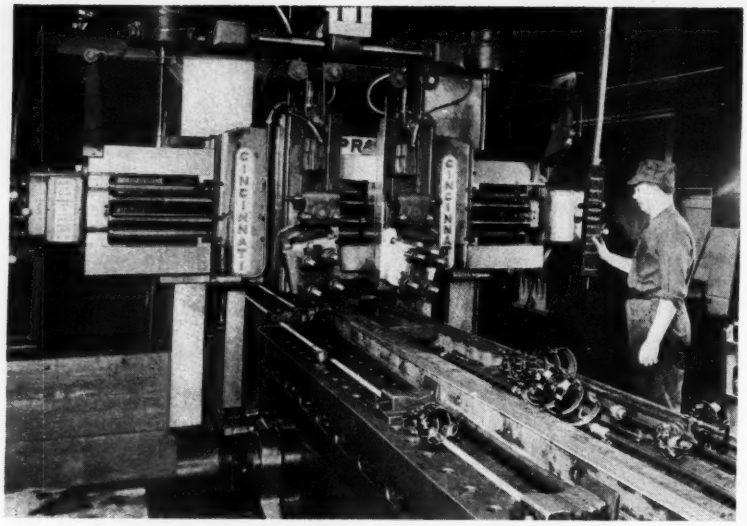
Change of Pace—This industry will be looking for customers in the months ahead, says J. A. Proven, vice president, Porter-Cable Machine Co., Syracuse, N. Y., and new president of ASMMA. The change in business tempo from the worry about shortages last year requires a comprehensive stepping up of marketing methods, sales promotion and sales management methods, he observes.

Bright Side — There's a bright side to the picture, though. Ralph M. Johnson, vice president, Norton Co., Worcester, Mass., pointed out that improved sales and merchandising programs "are bulwarked by increased availability of critical raw materials, such as rubber, lead and aluminum, which have been scarce for the last two years. Now manufacturers can go ahead with new products, many of which have been held back in production by scarcities of raw materials."

Because packaging will play a big part in the sales efforts, the manufacturers and distributors will give increasing attention to it. There is a continued trend toward packing small items, such as hacksaw blades, in units of ten to facilitate pricing and sales.

At the Helm—In addition to Mr. Proven, officers of ASMMA are: First vice president, J. R. Kelley, Manning, Maxwell & Moore Inc., Muskegon, Mich.; second vice president, T. D. Vander Voort, Clemson Bros. Inc., Middletown, N. Y.; and treasurer, F. P. Green, Delta File Works Inc., Philadelphia.

New president of the National Industrial Distributors Association is Harold E. Torell, Syracuse Supply Co., Syracuse, N. Y. L. F. Perkins, Henry Walke Co., Norfolk, Va., heads the Southern Industrial Distributors Association.



QUICK-REVERSING MOTOR UPS PLANER OUTPUT

. . . electronic controls achieve faster, more accurate reversals

New Motors: Answer to Rising Wage Costs

RAPID-REVERSING electric motors, designed to make industry's tools more productive and to permit greater strides toward automation, are being unveiled by Reliance Electric & Engineering Co., Cleveland.

The new motors with associated generator and electronic controls are available in sizes from 1 to 500 horsepower.

The 500-horsepower motor is capable of coming to a full stop in three revolutions and reversing in eight-tenths of a second.

Push-Button Power — Reliance engineers believe their new development will help lower production costs and contribute toward the more fully automatic factory. They see improvements in motors and drives helping to offset steadily mounting labor costs and keeping the price of products within a range where they can be sold in large volume.

Electronic Brain—The new motor has a small diameter armature and a high flux. It makes use of two electronic circuits to impose, briefly, several times the normal voltage on both motor armature and field. Controlled within predetermined current limits, these forcing circuits make it possible while maintaining maximum torque to reverse the motor with greater speed than formerly was possible.

Reliance also is introducing a new floating worm gearmotor (see p. 75), special motors for the shipbuilding and coal mining industries and a totally enclosed dual-cooled dc motor.

Equipment Committee Gets Nod

Advisory Committee on Production Equipment was officially established within the Office of Defense Mobilization. The committee originally was called Production Policy Advisory Commission (STEEL, May 12, p. 63) and is headed by Harold Vance, chairman and president of Studebaker Corp., South Bend, Ind. Other members of the committee are: Clay Bedford, president, Chase Aircraft Co., Trenton, N. J.; Manly Fleischmann, present Defense Production Administrator who will serve on the committee when his resignation as Defense Production Administrator becomes effective June 1; Gen. K. B. Wolfe, Rtd., former chief of Air Force Procurement.

Earthmoving Equipment Moving

Shipments of excavating and earthmoving equipment in 1951 were valued at $765 million, an increase of 36 per cent over 1950's $562 million figure, according to the Bureau of the Census, Commerce Department.

Cost-of-Living Boost Granted

Under the recent Wage Stabilization Board ruling making wage hikes within the cost-of-living formula self-administering, Westinghouse Electric Corp. employees not represented by unions and those whose unions have accepted the company proposal will be granted increases.

Designed to cover the rise in the cost of living since last Sept. 15, monthly increase will be $1.75 to $4.35 for nonexempt clerical employees. For exempt employees (supervisory, professional and administrative) it will be one per cent or the same amount as the nonexempt employees, whichever is greater. The rise will affect over 15,000 workers.

National Payroll Swells

Based on the national payroll, the country's economy is still expanding. Compensation of employees in the first quarter increased nearly $4 billion from the preceding period, reaching an annual rate of $185 billion. This is 25 per cent above the rate prevailing just prior to the Korean conflict.

The increase has slackened since the second quarter of last year. Of the $8 billion increase since mid-1951, $3.5 billion is accounted for by the further advance of government (including military) payrolls.

In private industry, both employment and hours worked have receded since the middle of last year; the total payroll advance has stemmed from the further, though slackening, upward movement of average hourly earnings.

Production worker employment in manufacturing plants declined by about 410,000 over the past year to 12.7 million in mid-April. Additions to the workforce in defense-related industries were outweighed by reductions in consumer goods and building materials manufacturing. Unemployment of 1.6 million workers in early April remains at a postwar low for the season.

Curbs Off, Sales Still Down: What's Up?

With only a few exceptions, the expected sales increase in consumer durable goods after removal of Regulation W hasn't materialized. Dealers and manufacturers are worried

REMOVAL OF Regulation W has yet to bring the over-all sales boost which many expected, and dealers who blamed the curb for slow sales are worried. All report that buyers, who didn't even bother to come in before, are looking again; but in most cases they just aren't eager to sign.

Finance companies report that their biggest activity is refinancing loans made under the control to reduce monthly payments for workers who no longer have overtime and bonus earnings to meet the higher short-term tariffs.

Whys and Wherefores—One explanation for the continued sales sluggishness is that the credit picture has not been changed too much by the action. Virtually all firms are holding to the same down payment on automobiles and appliances mandatory under the control, but now offer 24 months to pay the balance instead of the former 18. The down payment was the stumbling block for most buyers, say the finance men, and it's still there.

The occasional ads for "no down payment and long, long terms" are in most cases merely sellers' "come-ons". You just can't buy this way unless your credit rating is A-1, and few people with A-1 credit had trouble buying before. Then, too, long term financing is costly and extends into an uncertain future for many workers.

Not Cut and Dried—For some dealers, however, the expected boom has materialized at least in part. Some department stores report a 40 per cent increase in appliance sales, and many used car dealers are having a big field day.

Interestingly enough, many purchasers who have come out of hiding are cash-buyers rather than credit-seekers. They may have feared a shortage would develop but most dealers admit such fears are groundless.

Inventories Large—Automobile sales show only the usual spring buying increase, and for some even that annual bonanza is lagging. Inventories of refrigerators, ranges and other hard goods are large. Frigidaire Division of General Motors Corp. recently cut 2000 persons from its payrolls. General Electric Co. suspended production at its refrigerator and freezer works at Erie, Pa. because of "heavy inventories."

Retail stores have ample stocks of durable goods on hand to meet current demands, says the NPA after making a survey. Inventories of television sets, furniture and most major appliances are "in excessive supply in relation to the current level of sales." The agency sees the supply situation as comparable to that prior to Korea.

Controls, Now Conservatism—Auto dealer groups, once bitter opponents of control, are now warning their members and the public about unsound credit. General Motors Acceptance Corp., financing agency of the automaker-appliance firm, published a full page ad in many major newspapers warning buyers "Don't Be Misled By 'Easy Terms' ". The admonition, like the fight against controls, may prove to be academic.

GERMAN GIANT PACKS 15,000 TON PUNCH
. . . slow, heavy pressure good for high magnesium content alloys

Alcoa Gets Giant German Press

A 15,000-ton forge press made in Germany during World War II is now in operation at the Cleveland works of the Aluminum Co. of America. Built early in the war, the press was constructed by the Schloemann Co. of Dusseldorf for use in Germany's wartime light alloy industry.

The unit, leased from the U. S. Air Force, will make it possible for Alcoa to produce large aluminum and magnesium forgings for aircraft faster and more economically.

With auxiliary equipment the press is valued at $6.2 million and installed is 22 feet long, 18 feet wide and extends 18 feet below ground level and 36 feet above.

A double-acting air cylinder application, which up-ends hand cars containing waste on the down stroke and returns the cart gently to the floor on the up stroke, eliminated the need for an expensive loading platform at Burroughs Adding Machine Co., Detroit

Air Cylinders Expand

New uses and growing defense work assure manufacturers of another good year in 1952

PUSH, PULL. Raise, lower. Open, close. If these operations are repeated continually at your plant, it might pay you to look into the use of air cylinders.

So many companies are taking advantage of this form of automatic control that manufacturers of air cylinders expect 1952 sales in the $50- to $100-million-a-year industry to remain at high 1951 levels. About 12 companies form the core of the industry, with about as many firms which make machinery using cylinder control also contributing to the output.

Myriad Means—Working on the same basic principle as an automobile tire air pump, air cylinders perform oft-repeated movements in industry which are time-consuming and expensive when done manually. They're used to control automatic chucking and feeding on machine tools. Tire building machines are air cylinder controlled. In the foundry, air cylinders work in core machines, in shaking operations and in ladle pouring control. In the chemical industry, they're used in conveying and mixing operations and in automatic valve control. Much ammunition powder loading and atomic energy research control is done with air cylinders. The automotive industry uses many air cylinders for conveyor and machinery control. Air cylinders are found even in canning factories, laundries and match-making firms, to mention a few.

"Military uses don't differ much from civilian applications which are mostly on stationary equipment," says A. F. Jensen, president, Hanna Engineering Works, Chicago. About 20 to 25 per cent of the industry's output goes directly to defense, though some companies are working 100 per cent on rated orders. "Output for defense has increased 50 per cent over 1951," estimates Nelson Ortman, Ortman-Miller Machine Co. Inc., also of Chicago.

Three Major Metals—Steel, both cold-drawn tubing and castings, brass and aluminum are the major metals used in air cylinders, according to H. B. Link, president, Bellows Co., Akron. Brass tubing currently is in the most critical supply. Though use of steel and brass predominates at present, applications for aluminum in cylinders are increasing rapidly.

In fact, the salient characteristic of the whole industry is the growth of new applications to make repetitive motion automatic. "Ninety-nine chances out of 100, cylinders can do it," says Mr. Link.

Small Firms in Line for More Navy Contracts

THE NAVY is setting its procurement course in the direction of more small firms. Already, its small business specialists have awarded a substantial portion of Naval purchases to companies designated as in the "small business" category.

More Emphasis — In the first nine months of this fiscal year, small business received $1.6 billion or 22 per cent of the prime contracts awarded by the Navy. This compares with $648 million or 18 per cent bought during the corresponding period of the last fiscal year. And signals indicate a further emphasis on small business.

Of the $680 million the Navy obligated this March, a third—$228 million—went to small companies.

Among the latest Naval procurement contracts are two orders for aircraft carrier equipment.

Up Fast—A new type of catapult for launching aircraft will be developed by Jackson & Church Co., Saginaw, Mich. The catapult is expected to get aircraft off the carriers into the air more quickly.

A contract to build forced-air blowers for the new carrier, *USS Forrestal,* was awarded to the Westinghouse Corp. by the Newport News Shipbuilding & Drydock Co., builders of the vessel. The steam-driven, propeller-type blowers will furnish draft to the ship's boiler.

Contracts in excess of $250,000:

PRODUCT	CONTRACTOR
Milling Machines	G. A. Gray Co., Cincinnati
Fire Trucks	Hesse Carriage Co., Kansas City, Mo.
Tractors (2 Contracts)	International Harvester Co., Chicago
Trucks, Fork Lift	Baker Industrial Truck Div., Baker-Raulang Co., Cleveland
Shells, 81 mm	Fasco Industries Inc., Rochester, N. Y.
Mortars	Whirlpool Corp., St. Joseph, Mich.
Mortar Shells, 60 mm	Oliver Corp., Chicago
	Bailey Products Corp., Union City, Ind.
Fuzes, Rocket	Monarch Governor Co., Detroit
Metal Parts for Shells	L. A. Young Spring & Wire Corp., Detroit
Metal Parts for Rockets	National Tube Div., United States Steel Co., Pittsburgh
Parts for Boosters	Clary Multiplier Corp., San Gabriel, Calif.
Cartridge Cases	Servel Inc., Evansville, Ind.
	Norris-Thermidor Corp., Vernon, Calif.
Mines, Anti-Personnel	Auto Specialties Mfg. Co., St. Joseph, Mich.
Hand Grenades	Richmond Foundry & Mfg. Co. Inc., Richmond, Va.
Generator Sets	John R. Hollingworth Corp., Clifton Heights, Pa.
	Steward & Stevenson Services Inc., Dallas, Tex.
Radio Sets	Hallicrafters Co., Chicago
Radio Receivers	Hammarlund Mfg. Co., New York
Mountings	Caroled Co., New York
Telephone Maintenance Parts	Hallicrafters Co., Chicago
Reels, DR-15-B	Arvin Industries Inc., Columbus, Ind.
Aircraft Parts	Jacobs Aircraft Engine Co., Pottstown, Pa.
Compasses	White-Rodgers Electric Co., St. Louis
Transmitters	Eclipse-Pioneer Div., Bendix Aviation Corp., Detroit
Propeller Shaft Assemblies	Erie Forge Co., Erie, Pa.
Steel Gasoline Barges	Northeastern Boiler & Welding Ltd., Portland, Oreg.
Metal Beds	Axelson Mfg. Co., Los Angeles

CHECKLIST ON CONTROLS

GOVERNMENT control orders are digested or listed each week in this "Checklist on Controls." For complete copies of NPA orders, write to NPA Distribution Section, first Basement, New GAO Bldg., Washington 25. For copies of OPS orders, contact nearest OPS district or regional office. For copies of OPS news releases, write David S. Phillips, director, OPS Administrative Services Division, Temporary E Bldg., Washington 25.

Materials Orders

CANS—Amendment of May 14, 1952, of NPA Order M-25 relaxes some of the restrictions on the use of metal cans. The action was retroactive to Apr. 1, 1952.

PETROLEUM OPERATIONS — Amendment of May 14, 1952, of NPA Order M-46A revises the list of materials that are subject to this order. The amendment was effective May 14.

BISMUTH—NPA Order M-48 controlling bismuth was revoked May 15, 1952.

CADMIUM—NPA Order M-19 controlling cadmium was revoked May 15, 1952.

LEAD—NPA Order M-38 controlling the use of lead and NPA Order M-76 controlling the distribution of lead were revoked May 15, 1952.

ANTIMONY — NPA Order M-39 controlling antimony was revoked May 15, 1952.

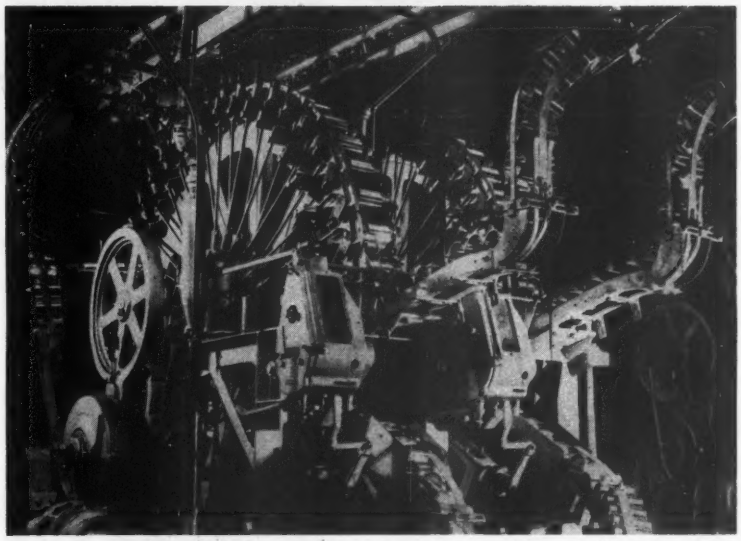
ZINC—Amendment of May 15, 1952, of NPA Order M-9 removes the allocation and use controls from zinc and abolishes restrictions on acceptance, delivery and distribution of zinc scrap and on toll agreements. Inventory control is retained in M-9 but the limitation provision is modified to permit slab zinc users to carry a 60-day inventory. NPA reserves the provision by which directives may be issued when necessary to assure delivery of zinc for a specific purpose. The amendment was effective May 15, 1952.

LINE PIPE—Direction 3 to NPA Order M-46 moves from July 1 to June 5 the deadline for filing applications for fourth quarter priorities assistance in purchase of line pipe for small construction and production operations and MRO in the oil and gas industries. The date is advanced to enable the Petroleum Administration for Defense to issue purchase authorizations at an earlier date. Direction 3 was issued May 19, 1952, and made effective on that date.

RESORCINOL—Allocation controls on resorcinol are ended through revocation of Schedule 6 to NPA Order M-45. The revocation was issued on May 19, 1952, and made effective on that date.

NPA Regulation

INVENTORIES—Amendment of May 16, 1952, of NPA Regulation 1 removes all inventory controls from bismuth, cadmium, lead and antimony and liberalizes inventory limitations on zinc. These changes bring NPA Reg. 1 (inventory control) into conformance with actions taken May 15, 1952, to remove NPA materials controls from bismuth, cadmium, lead and antimony and to ease controls on zinc. Amendment of NPA Reg. 1 was effective May 16, 1952.



Tin cans, seen in production at the Continental Can Co., will be more plentiful now that NPA has relaxed some of the restrictions imposed by Order M-25

NPA Delegation

BLISTER COPPER — Amendment of May 16, 1952, of NPA Delegation 5 transfers authority to allocate blister copper from the Defense Materials Procurement Administration to the National Production Authority. The action was taken to provide effective control over future production of copper sulphate, which is being produced in excess of requirements. The amendment was effective May 17.

Price Regulations

WATCHES, CLOCKS — Ceiling Price Regulation 145 issued May 16, 1952, is a tailored regulation establishing ceiling prices for assemblers of watches and clocks containing imported movements cased in the United States. It is effective June 16, 1952, or any earlier date between May 16, 1952, and June 16, 1952, as the assembler may select. With issuance of the new regulation, the Office of Price Stabilization removed watches and clocks with imported movements from coverage of Supplementary Regulation 12 of Ceiling Price Regulation 22. This removal was effected through Amendment 10 of SR 12 to CPR 22.

PLUMBING FIXTURES—Supplementary Regulation 26 to Ceiling Price Regulation 22 provides adjusted ceiling prices for manufacturers of vitreous china plumbing fixtures, enameled cast iron plumbing fixtures, and cast brass plumbing fixture trim. SR 26 was issued May 15, 1952, and made effective May 20.

PASSENGER AUTOS—Amendment 4 of Revision 1 of Ceiling Price Regulation 1 says that passenger automobile manufacturers who eliminate or modify an item of standard equipment after a ceiling price for the car has been established need not obtain a new ceiling price when the elimination or modification reduces their direct labor and material costs no more than $2. When the reduction is more than $2 new ceilings will be required.

Appointments in Washington

H. G. Schoeninger, of the Flori Pipe Co., will serve as an industrial analyst for six months with the Engine & Turbine Division, National Production Authority. Also he will preside at meetings of the Fabricated Metal Piping Industry Advisory Committee held at regular intervals in Washington.

Harry N. Stein, former head of the Consumer Goods Division, Office of Enforcement, was named special assistant to the Director of Enforcement, Office of Price Stabilization.

Benjamin Freidson, formerly a hearing examiner with the Interstate Commerce Commission, was named acting director, Consumer Goods Division, Office of Enforcement, Office of Price Stabilization.

Dr. C. Guy Suits, vice president and director of research, General Electric Co., Schenectady, N. Y., was named a civilian member of the Committee on Electronics, Research & Development Board, Department of Defense.

James D. Glenn, general manager of stainless steel sales, Crucible Steel Co. of America, will become chief, Stainless Steel Section, Iron & Steel Division, National Production Authority, after June 16, replacing Joseph P. Butterfield, who will resume his duties with Armco Steel Corp.

George R. Kinney, sales manager of the V & O Press Co., division of Emhart Mfg. Co., Hudson,, N. Y. was appointed chief, Forge & Press Section, Metalworking Equipment Division, National Production Authority.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor*

DPA and NPA officials are on the spot in their efforts to relax controls yet keep the control machinery extant. If some congressmen had their way, controls would end soon

IF DPA AND NPA brass hats seem to be talking out of both sides of their mouths there is an explanation for it.

On the one hand, they are keeping their promise to relax materials controls as fast as in their opinion the supply-demand relationship warrants. On the other hand, they see a compelling need for preserving the control authority, the control forms and the control machinery. With world conditions as they are, DPA and NPA officials say it might be a mistake to encourage an impression that the relaxation of controls means a return to free normal markets.

On Two Fronts—Their No. 1 fight is on Capitol Hill where many congressmen think the control authority safely may be terminated at a comparatively early date. Their No. 2 fight is to maintain the flow of competent industry men to Washington to serve in the DPA and NPA on a rotating basis.

With most control orders in written form so that they can be reinvoked if necessary, and with an increasing number of control relaxations, industry men in these agencies have less work to do. Many think they would be wise to go back home to their regular jobs. The top officials, however, maintain that these men must continue to serve so that these two agencies will be ready for any emergency that may lie ahead. If the personnel should be liquidated, they say, it might take months to reman the agencies.

Producer vs. Consumer—In the present diversity of views, two industry groups appear to be sharply opposed to each other. The primary producers of controlled materials would like to be freed of all shackles as soon as possible and revert to their normal distribution patterns, subject only to defense priority requirements.

The great majority of consumers—and this holds good for the metalworking industries — would like a continuation of controls; at least those features providing for allotments under the controlled materials plan and limiting inventories of controlled materials. In other words, the DPA and NPA officials have a vast amount of industry support in their effort to preserve the controls power and the controls machine (see p. 59 for more on this).

Travel by Rail

These P2V Neptune Navy anti-submarine planes, unable to go by their own power as yet, travel on an elevated railway assembly line at Lockheed Aircraft Corp., Burbank, Calif. The system replaces the former method of mounting each fuselage on a separate dolly

Machine Tool Source, Maybe...

Defense contractors having difficulties in obtaining essential machine tools, and allied industrial equipment should seek assistance from NPA's newest organization, the Metalworking Equipment Division's Production Equipment Central Inventory Group.

The PECIG has authority to allocate machines from the Defense Department's central inventory and from the General Services Administration's national reserve. Also, PECIG is prepared to seek needed machines from other sources—from imports, from used machine tool stocks and from the plants of colleges and institutions.

Informed spokesmen point out that no miracles are likely—for the Defense Department and GSA inventories already have been well combed. However, the new group is expected to find ways and means of easing the procurement troubles of many contractors.

Label Alien Machines...

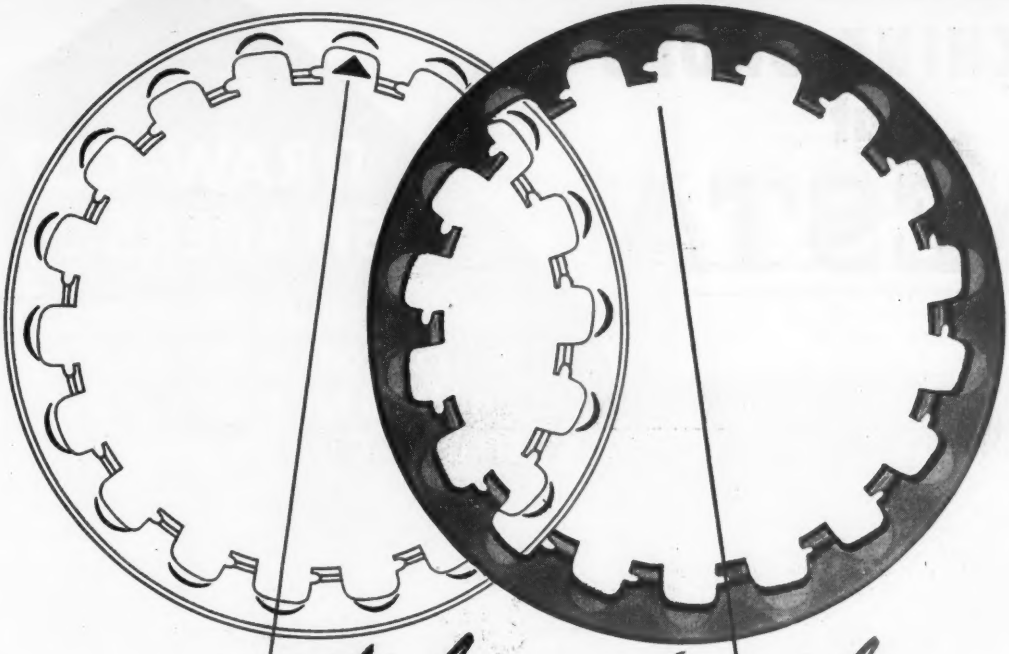
Complaints of the marketing of imported machines without revealing the country of origin are receiving quick action from the Federal Trade Commission. In the first case to be disposed of, two sewing machine distributors have been ordered to disclose to purchasers that the particular machines were made in Japan.

Renegotiation Self-Taught...

Regulations issued by the Renegotiation Board, under the Renegotiation Act of 1951, can be obtained from the Superintendent of Documents, Government Printing Office, Washington 25, on a subscription basis at $1.50 per subscription. The subscription price includes the basic book of regulations and for an indefinite period future amendments and additions.

Congressmen Rush In...

To avoid crippling strikes, some formula acceptable to both employers and employees must be devised, says Senator James P. Kem. He has introduced a concurrent resolution calling for the creation of a congressional commission, organized on the lines of the famous Hoover Commission, to study labor-management problems and come up with an answer that will point the way to stability of production during the period of national emergency stress.



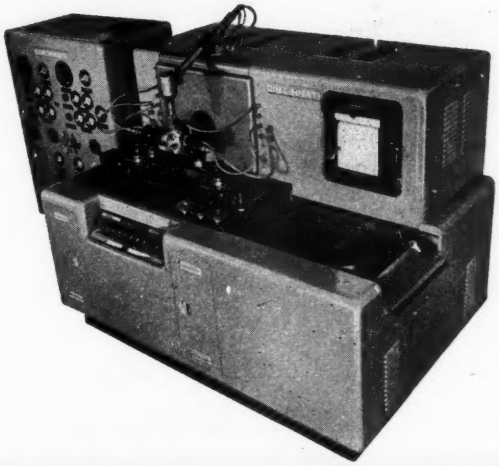
specified | *achieved*

definite hardness pattern | **excellent uniformity**

high production | **60 parts per hour**

distortion next to nothing | **rejects virtually nil**

with flamatic selective surface hardening



If ever there was one, here's a really tough heat treat job. The print called for all 18 internal lobes of this tank transmission cam (SAE 3145) to be hardened to Rc 53-60, body between lobes to remain ductile, pattern so consistent that inspection of only 1% of production would be permissible.

The nital etched section shown above (about half size) clearly shows the results achieved by Flamatic selective hardening. Production of 60 parts per hour was ten times faster than previous method. Scrap losses dropped practically to zero.

Gears, cams, rollers, parts with multiple diameters, etc., up to 18" OD depending on width or shafts up to 24" long depending on OD are readily handled on the Standard Flamatic. Write for Catalog No. M-1724 which includes case histories. Send part prints for analysis and recommendations.

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THE CINCINNATI MILLING MACHINE CO

Cincinnati 9, Ohio, U.S.A.

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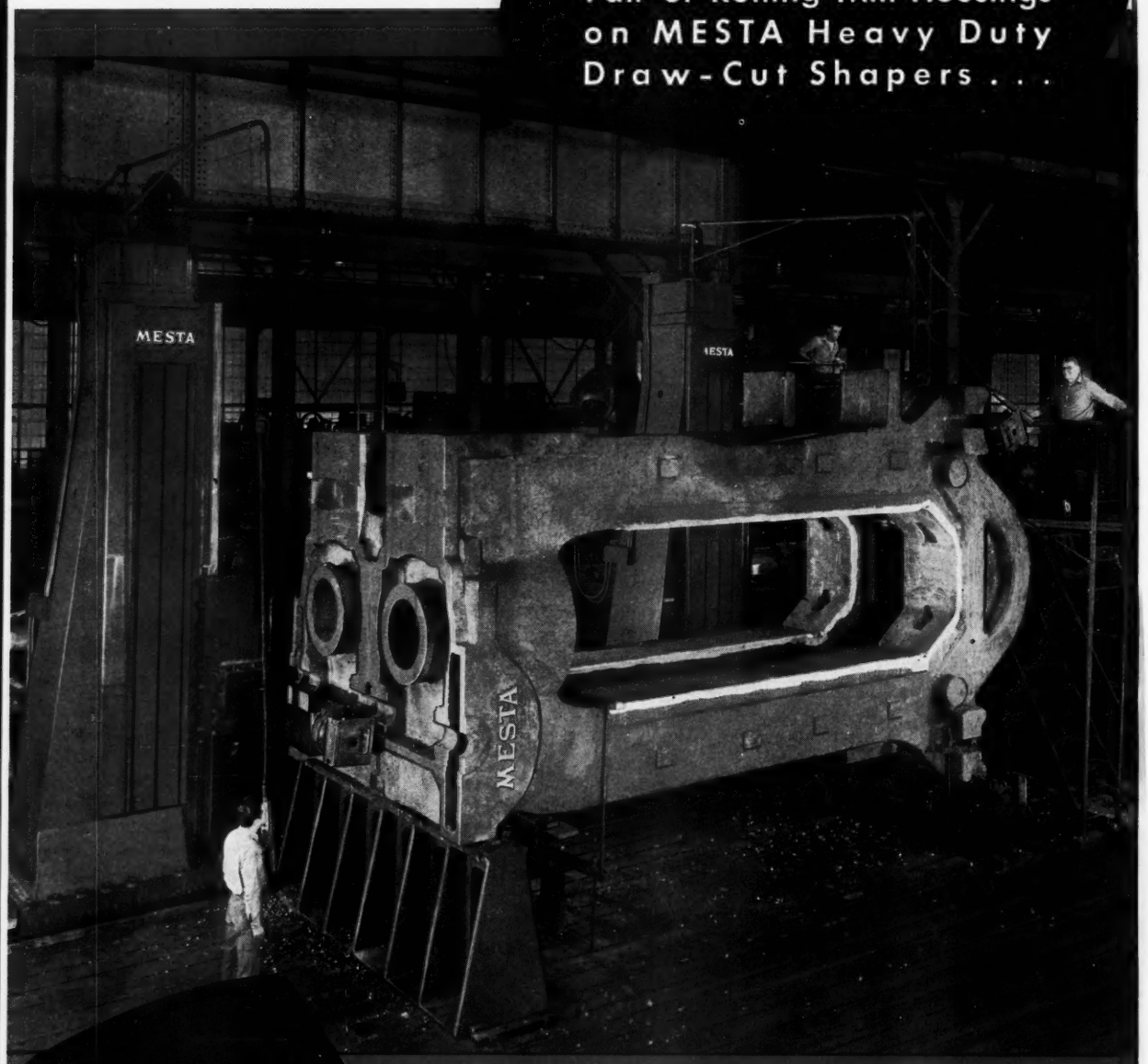
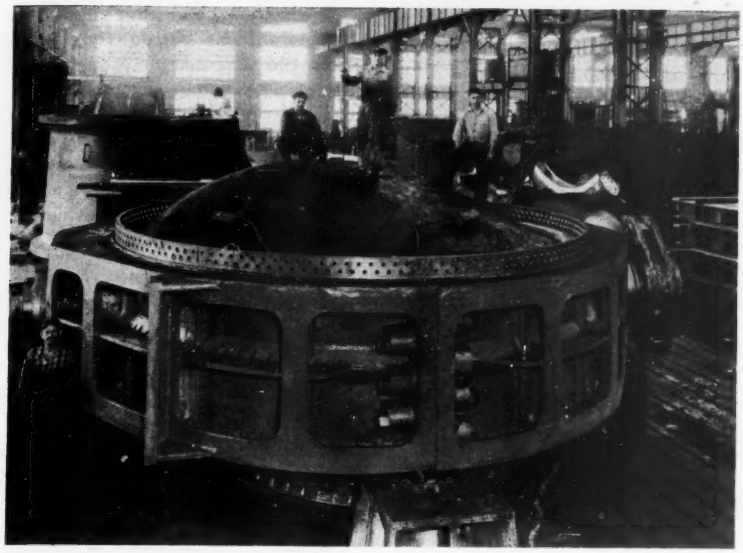


Designers and Builders of Complete Steel Plants

MESTA MACHINE COMPANY
Pittsburgh, Pa.



Boost for Brazil

This 17-foot butterfly valve, built by the Baldwin-Lima-Hamilton Corp., Philadelphia, is ready for shipment to Brazil where it will be installed in the Rio de Janeiro Tramway, Light & Power Co. Ltd. system. One of eight such valves purchased for the Paraiba-Pirai Diversion project, it will help boost the system's rating from 1.57 billion kwhr per year to over 4 billion kwhr

Consumer Durable Imports: More or Less?

The clash was due sooner or later between the administration which wants to promote foreign trade in both directions and domestic producers who want to protect their markets

THE BATTLE is joined for and against slowing down the volume of foreign imports, especially consumer durable goods, into this country.

Among proponents of greater control of imports are the manufacturers of some durable goods who are concerned with inroads being made into their markets by foreign brands. These firms argue that the foreign producer can get raw materials in quantities which are forbidden the domestic producer, and that the biggest, if not only, selling point of the foreign makes is that they are immediately available.

Protective Device—Some domestic producers are dissatisfied, too, with the share of the world's raw materials which they are getting. They say that either they should get enough steel, copper and aluminum to hold their domestic markets or foreign products using these materials should be excluded to protect the markets until the scarce materials are again equally available.

It's at this last point that the State Department has taken issue in its comments on the proposed H. R. 6843. That bill would establish quotas on the importation of certain products made from raw materials on which priorities or allocations are in effect in this country. It would require the President to cut imports of any product to one-half the quantity imported from 1947 to 1949 whenever the product contains such controlled materials and a "substantial portion of domestic producers of the article" requests such import limitation.

Little or No Help—Willard L. Thorp, assistant secretary of state for economic affairs, told the House Banking and Currency Committee, considering the bill, "Cutting down on imports does not result in boosting domestic production where that production is being held back by a shortage of raw materials."

In addition to being no help in getting more materials for domestic producers, the State Department maintains H. R. 6843 may do U. S. foreign policy irreparable harm. Many countries are tightening their home-consumption belt to build up exports and foreign exchange. If they can't send their exports to the U. S. for dollar credits, they're likely to send them to Soviet block countries in exchange for the things they want.

IMC Reports on First Year

The major accomplishment of the International Materials Conference during its first year of operation was the development of plans for international distribution of the materials in short supply, and securing their prompt acceptance by the participating countries, according to the first yearly IMC report.

Example of how IMC recommendations work: The Chilean government, in accepting the Copper-Zinc-Lead Committee's recommendation of second quarter, 1952, copper and zinc distribution "reserved the right to dispose of 20 per cent of the copper production of its large mines and the total production of its small and medium mines without regard to the distribution scheme."

Convertibility Gets Guaranty

Two American firms recently signed currency convertibility contracts with the MSA under its Industrial Guaranty Program.

National Aluminate Corp., Chicago, under the contract with MSA is guaranteed the convertibility into dollars of up to $1,331,000 in Italian lire as proceeds from the wholly-owned subsidiary plant it is establishing in Cisterna, Italy. The Italian plant will make water-treating chemicals.

Cooper Alloy Foundry Co., Hillside, N. J., has a MSA guaranty of currency convertibility of up to $153,000 over a 10-year period as royalty payments from A.P.V. Co. Ltd., London. A.P.V. will use the Cooper process for making stainless steel, nickel and Monel valves.

Lone Star Reluctant

It wants full write-off privileges; will concentrate on steel plant and pipe mill completion

NEXT MOVE for another new 1200-ton blast furnace at Lone Star Steel Co.'s Daingerfield, Tex., works appears to be up to the government.

Lone Star withdrew its application for a $50 million RFC loan when DPA approved fast amortization of only 75 per cent of the cost of the facilities. The company—approached by the government with the furnace-building plan at the time of the pig iron scare—feels a 100 per cent write-off is necessary under present market conditions. "At this time we don't intend to go ahead with building the second furnace," says W. H. Johnson, executive vice president. The certificate of necessity has about five more months to run, so a change in plans is possible.

Still Chewing — One reason for shelving the furnace plans: Lone Star has its hands full getting its new steel mill into operation. Another is that the company is striving for balanced operation and the new blast furnace would make it top heavy in pig iron capacity.

The new steel plant (ingot capacity: 500,000 tons) and pipe mill (350,000 tons of oil country tubular goods yearly) are being pushed toward completion. The company hopes to start rolling steel line pipe, casing and tubing by yearend.

Completion Schedule—The open hearths will be ready by October. Some metal will be diverted from the pressure pipe department, cutting monthly production of that product to about 3500 tons. When the steel pipe mill goes into operation by yearend, it'll be ahead of the rolling mill, so the company will operate temporarily on purchased skelp or ingots converted into skelp.

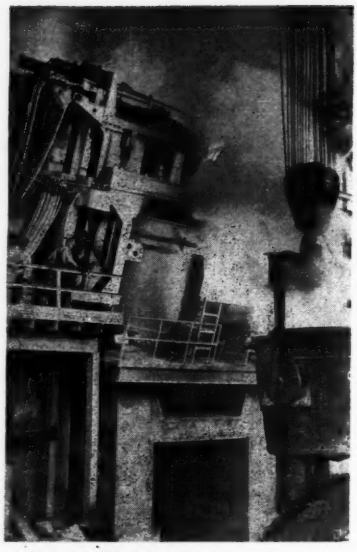
Lone Star should have little trouble selling the oil country goods it makes for about five years —demand is that strong. Eventually, the company thinks it will supply about 15 per cent of the steel pipe used in its five-state market area.

Back-Yard Mining — Lone Star can well disclaim the high cost label affixed by some. Its raw materials are all nearby; most remote is coal, which comes 200 miles from Oklahoma. Mining of raw materials is a year-round operation. Even using its relatively low-grade ores, the hot metal cost is competitive.

Cost of ore delivered to blast furnace is calculated at less than eight cents per Fe unit—a comparatively low figure. Freight advantages are obvious: Finished products can be delivered under the freight umbrella at an average advantage of better than $10 a ton over the market area served by Lone Star.

The Texas Market — Though equipped to turn out up to 16-inch steel pipe, Lone Star will concentrate on three sizes: 5½-inch (oil string or producing pipe), 9⅞-inch (protection string or conductor) and 10¾ inch (surface pipe). These sizes comprise about 95 per cent of the oil well pipe used in the area. The operation isn't competitive with A. O. Smith Corp. of Texas, Houston, which makes large diameter welded steel pipe for oil and gas transmission lines.

Indebted to the government for $73 million, Lone Star hopes to have its loans repaid five years from the time complete operations start. The young organization is confident of its future in steelmaking. E. B. Germany, president, sums it up this way: "We feel that our five years of operation and experience justify our belief that we can always remain competitive."



Added Output

Atlantic Steel Co., Atlanta, taps a heat of steel from its 60-ton electric furnace in a new $2.5 million plant. With an annual capacity of 112,000 tons, the plant will increase the firm's output by over 50 per cent

Ingersoll Building Furnaces

Two new 18-ton capacity electric steel melting furnaces are being installed in the Chicago plant of Ingersoll Products Division, Borg Warner Corp.

Recent steel shortages and the high price of premium steel have prevented the company from meeting the demand for its agricultural and automotive products, says R. S. Ingersoll, divisional president.

New units will be able to pour about 240 tons of steel a day.

Scrap Users Oppose Allocating

Scrap, needed so badly just a year ago, is now in sufficient supply so that the government should allocate it only at the request of consumers. That is the opinion of the Iron and Steel Scrap Consumers Industry Advisory Committee as told to NPA officials.

If maximum production of steel is maintained through this year, another shortage is likely to occur in the winter. In the meantime, the committee wants NPA to suspend its M-92 order for auto wrecking yards. The scrap salvage operation should be continued, but no new drives or programs should be planned unless there is an immediate market for the scrap.

Necessity Certificates Issued

Certificates of necessity for accelerated tax amortization of 456 new or expanded defense facilities amounting to $828,549,238 were approved by DPA during the last two weeks of April. Including the above amount, over $18.7 billion has been approved for 9830 projects thus far.

Pipeline, electric power, railway and water transportation requests comprised the bulk of the approv-

als during the two week period. The largest, $98,900,843, went to Texas Eastern Transmission Corp., Shreveport, La.

Production Levels Cited by NPA

What percentage of consumer durable production is being sustained with the controlled materials currently available? H. J. Holbrook, director, Consumer Durable Goods Division of NPA, gave the following production indicators for gas-fired equipment in a speech before the Liquid Petroleum Gas Association convention in Chicago.

Gas refrigerators are probably being produced at about 50 per cent of the 1950 rate. Gas clothes dryers are being produced at a higher rate than 1950 levels but, due to low saturation, production does not meet demand. Domestic ranges, based on the availability of materials, can be produced at about 65 or 70 per cent of the 1950 rate. Space heater and water heater production at the present time, again based on availability of materials, could average about 85 per cent of the 1950 rate, while commercial cooking equipment can be produced at the full 1950 rate.

More Small Business Loans

Reconstruction Finance Corp. has granted loans totaling $1,346,750 to nine small business firms on the recommendation of SDPA, bringing to 55 the total number of such loans to date.

Largest single loan of the nine announced was to American Machinery Corp., Orlando, Fla., in the amount of $500,000 to purchase machinery for the manufacture of shell cases. Smallest was $19,500 to East Texas Scrap Salvage Co., Tyler, Tex.

Clinic Profits Small Shops

Over $16 million in prime and subcontracts for defense procurement have been awarded to 106 small manufacturers as a result of the Industry Assistance Clinics held last January. The clinics were held in an effort to develop defense contracts for small manufacturers of less essential consumer-type products who received low allotments in controlled materials for the first quarter of this year.

Controls Ease, But Watch Labor—

Control relaxation in steel, copper, aluminum, zinc and decontrol of bismuth, cadmium, lead, antimony look good. But with labor unrest, actions could just be for the record

DECONTROL of bismuth, cadmium, lead and antimony together with relaxation of controls on zinc and construction materials is announced by the National Production Authority. Sufficient supply to assure that defense requirements can be met for the remainder of the year was the reason cited by NPA officials for the action.

Flexibility, Not Finis — The action is not a signal for the end of controls, however, says Henry H. Fowler, NPA administrator. "An impression to the contrary might be derived from the flexibility of the government's system of controls. When they are no longer needed, they are removed; but the mere fact that a few materials have been expanded to a point where the supply is equal to, or slightly in excess of, demand does not imply that all materials are in such a favorable position.

"I would be the last in the world to wish to continue these controls when they are no longer necessary," he claims.

A Bird in the Hand—Under the new NPA directives, all of which are effective July 1, bismuth, cadmium, lead and antimony will be completely free of all control. Zinc allocation is removed but inventory control is retained, amended to permit zinc slab users to carry a 60-day supply or minimum practicable working inventory, whichever is greater, rather than the former 30-day limit.

Recreational construction will now be permitted use of controlled materials with self-authorization per quarter of: Five tons of carbon steel, not to include more than two tons of structural shapes; 200 pounds of copper and 250 pounds of aluminum.

General construction will be permitted increased self-authorization up to: 25 tons of carbon steel with no limit on the portion of this amount that may be structural shapes; 750 pounds of copper and 1000 pounds of aluminum.

Present limitations of aluminum to industrial and public utility construction will be removed as of July 1 so that it will be possible to use aluminum in some quantity in all types of construction.

Reclassification—Formerly classified as commercial, the following will now be considered industrial construction: Transportation facilities, public utility systems, water and sewage systems, administration buildings, garages and service buildings for industrial projects when owned and operated as part of the industrial project, crane runways and baler installations incident to scrap yard operations.

Provision is also made for the same use of finished conversion steel as now permitted for foreign and used steel. Some minor changes in wording of previous orders for clarification complete the effort.

Uncertainty, That's for Sure—All of these projected relaxations are subject to change in the event of altered conditions in the steel, copper or aluminum supply situations. With the glint in labor's eye and impending strike-induced shortages, business men wonder if the net effect of the ruling may not be simply for the record—to prove that NPA tried.

Aluminum Chic

IF ALUMINUM isn't coming out of your ears in the next few years, it may be helping to keep them warm. Latest wrinkle in the fabric business is the use of metallic-filled linings to provide added warmth in apparel with a minimum of weight.

Heralded as literally one of the "hottest" ideas in years, the process involves spraying or rolling aluminum powder onto the inside of the normal lining material of a coat or jacket. More than 10 million yards of the coated material are expected to be sold this fall.

2 ways to ease your Steel Shortage

1 Collect all dormant Steel Scrap and get it to the steel producers

Millions of tons of valuable scrap still lie idle in America. Scrap salvage means more production—a stronger America. Clean out your plant . . . sell all your iron and steel scrap to your local scrap dealer now. The need is urgent. Every bit will help to meet the needs of defense production.

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Users of N-A-X HIGH-TENSILE steel find they can make 3 tons do the work of 4. Through its high strength and corrosion-resistant properties, lighter sections can be used without sacrifice of quality. It fabricates and welds with the ease of mild carbon steel. Let us assist you in applying this economy to your products.

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NATIONAL STEEL CORPORATION

By H. C. TUTTLE *Detroit Editor*

Mirrors of Motordom

The British viewpoint: Power steering is more a sales argument than a truly useful development. But more American cars may get it on the next models

DETROIT

"THE POWER steering idea seems to have become a selling point out of all relation to its real utility. Although so far only applied to the bigger cars of the Chrysler and General Motors ranges, it seems likely that assisted steering will be offered as an option on many smaller American cars purely from a salesmanship angle, just as every manufacturer has to be able to offer a car without a clutch pedal."

That's the attitude toward power steering of one of the British automakers. It is fairly typical of the opinions expressed by that country's automotive engineers toward this latest development for American passenger cars.

Spreading—Currently offered by Chrysler, DeSoto, Oldsmobile, Buick and Cadillac and price-tagged at about $200, power-assisted steering mechanisms are certain to be included in other makes of large cars in 1953. The initial inability of producers of the devices to supply all comers prevented at least one carmaker from having it in the current model. Production is being stepped up under pressure of demand from those companies which now use the device and those which will.

Worth of power steering is a difficult thing to assess. Granted it makes parking less of a chore, takes most of the muscular effort out of highway driving and enables the driver to maintain control of the car under certain dangerous conditions—such as hitting a soft shoulder at high speeds—power steering, nevertheless, probably will not catch on with the average driver the way automatic transmissions have.

Different Viewpoint—The comments of British automen are interesting because they reveal the thinking of a group which understands the subject but can approach it in a reasonably detached frame of mind. The director of engineering of the Rootes group makes this statement: "It is considered that the introduction of power steering has been forced upon certain American manufacturers in order to overcome the resistance created by large-section low-pressure tires on their largest passenger car models.

"During World War II the Rootes group developed a power steering system for heavy armoured vehicles so that we have an extensive background of knowledge and experience on which to draw.

"It is considered that the present Hillman range, and for that matter all Rootes group products, has perfectly satisfactory steering characteristics without the added weight, cost and complication of servo-assisted steering."

"No Virtues"—The senior member of another company's technical staff has this to say: "Power steering has no virtues in itself. The public comes to accept a certain steering ratio (lower in America than in England) and they naturally complain if the effort to move the car under parking conditions exceeds a reasonable amount. This amount is dependent on tire size and the weight on the front wheels. If these combine to make the effort of steering too great, then power assistance is probably the only way out."

A member of the engineering staff of another English automaker has this to offer: "Just as we have entirely different problems on the transmission side because of our very different power to weight ratios, which put a premium on transmission efficiency that does not worry American designers so much, so our cars are generally much lighter and smaller and therefore power steering is not only unnecessary but would be quite impossible to justify at a time when we are struggling to get the cost of everything down. There does seem to be a better case for power steering in truck applications but the curious thing here is that, generally speaking, much larger trucks in America are not equipped with it." He agrees with some American automotive designers that the trend to power steering in cars will speed the acceptance of the development in U. S. trucks.

Eerie—The English engineer also says this: "It's significant that the initial Chrysler car installation produced a condition where practically no effort is required at the wheel rim to steer the car, which confers an absence of 'feel' which is alarming. The General Motors version which followed it requires a steering effort of 3 to 5 pounds at the rim, which is evidently more acceptable in practice, and most light British cars without assistance require efforts in average operation of 5 to 10 pounds, and the difference between 5 and 10 pounds isn't so much as it looks on paper."

Chrysler's philosophy with regard to power steering is that a lower steering gear ratio (number of steering wheel turns for a

Auto, Truck Output
U. S. and Canada

	1952	1951
January	409,406	645,688
February	467,692	658,918
March	517,206	792,550
April	569,504*	680,281
May		695,898
June		653,682
July		522,858
August		571,442
September		505,758
October		558,971
November		480,199
December		402,729
Total		7,179,161

Week Ended	1952	1951
April 19	131,657	166,502
April 26	135,769	162,740
May 3	130,108	154,523
May 10	130,509	180,577
May 17	131,695	156,127
May 24	130,000*	158,259

Sources: Automotive Manufacturers Association, Ward's Automotive Reports. *Preliminary.

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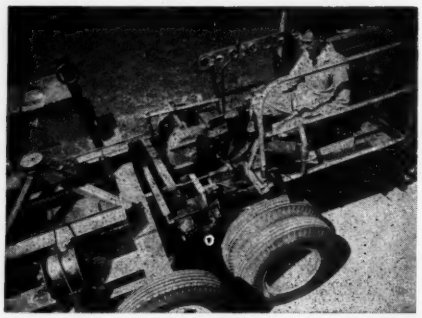

Playthings, a Buick engine and brains resulted in hillside paving of the General Motors proving ground at Milford, Mich. With two curves of 77 per cent maximum slope, the job was not easy. H. H. Barnes and Louis C. Lundstrom, proving ground officials, examine models of the track and equipment (left); a truck-mounted Buick engine and winch hold heavy machines on slope (center); truck-roller combination smooths the pavement (right)

given amount of front wheel turn) and constant operation are conducive to safer operation. Reason for higher ratios, from 24-29 to 1, was for ease of turning the wheel after gear efficiency in the form of antifriction components had been fully exploited. Power steering as incorporated by Chrysler is accompanied by a reduction in steering gear ratio to 16 to 1. At this lower ratio, steering is "fast," i.e., a small steering wheel turn brings forth a relatively large front wheel action. In GM's power-assisted steering, the ratio has not been changed materially. That is a liability, Chrysler men assert. They also contend that "road feel" is better maintained through their unit because the power is on continuously, and the consistency of the "feel" is of importance when driving on slippery surfaces. The GM unit comes into play only after 3-plus pounds of effort.

The argument between the two companies has become increasingly lively and probably will die only when one or the other decides to conform.

New Pontiac V-8 Progresses

The new Pontiac V-8 engine under development will contain hydraulic valve lifters to be supplied by General Motors' Diesel Equipment Division at Grand Rapids, Mich. An advantage cited for the hydraulic tappets is quietness and smoothness without necessity for periodic adjustments as in the case of mechanical units.

Both Chevrolet and Pontiac, presently using cast iron pistons, plan the switch to aluminum in their new models.

Angular Paving Job Done

A paving job which "couldn't be done" has been finished at General Motors' proving ground, Milford, Mich. The high-speed five-lane 3.8-mile track has two curves with a maximum slope on their outside lanes of 77 per cent, the equivalent of a 37 degree angle. Originally paved with concrete 26 years ago in what virtually amounted to a by-hand operation, these curves needed resurfacing, but the job couldn't be done with conventional equipment. For one thing the extreme slope would have tipped the paving finishing machine and roller over on their sides; for another thing their blades and rollers were designed for use on level or slightly crowned surfaces, not concave turns.

Solution of these problems came in three stages. Assigned the job of figuring out how the job could be done, Louis C. Lundstrom, head of the Proving Grounds Mechanical Engineering Department, studied the centers of gravity of the equipment, thrust of it at various angles and modifications necessary to enable it to operate efficiently. Next step was to use scale models of the paving finishing machine and roller and two other special purpose vehicles on a scale-model section of the track. Then before work on the actual track was started, a 200-foot long full size replica of a section of the turn was built to see whether Mr. Lundstrom's method would work.

Work on the track itself began with construction of a level road at the top of the turns, separated from the track by a foot-high, foot-wide curb. A tractor on this roadway held the finishing machine in place on the slope by means of a cable and winch. The roller, weighing 11 tons, was also attached to another vehicle on the upper roadway by means of a cable. This vehicle, a truck, mounted on its rear a Buick Roadmaster engine and Dynaflow transmission. By varying the amount of power transmitted by this combination to a winch the operator on the truck could play out more cable to allow the roller to descend the slope or reel it in to bring the roller higher. Maximum pull on the cable was about six tons. To stabilize the truck against this side pull, it was equipped with two sets of bogie wheels. Two rested on the top of the curb, and two, mounted horizontally under the truck, rode against the outside of the curb.

Electrical Changes for 1953

Plans of several automakers to adopt 12-volt electrical systems in their 1953 models signal a multitude of changes for parts suppliers —ranging from the battery makers to the lamp bulb producers and including the makers of wiring and the other electrical apparatus. The change will save materially on copper but will up the requirements for lead and other battery components. The larger battery, a six-cell rather than the present three-cell, will have to be fitted into an already jammed engine compartment, or placed, as Lincoln has done this year, under the floor boards. The higher battery cost may be offset by savings in the red metal, so the change possibly will not show up in the price tags of new cars.

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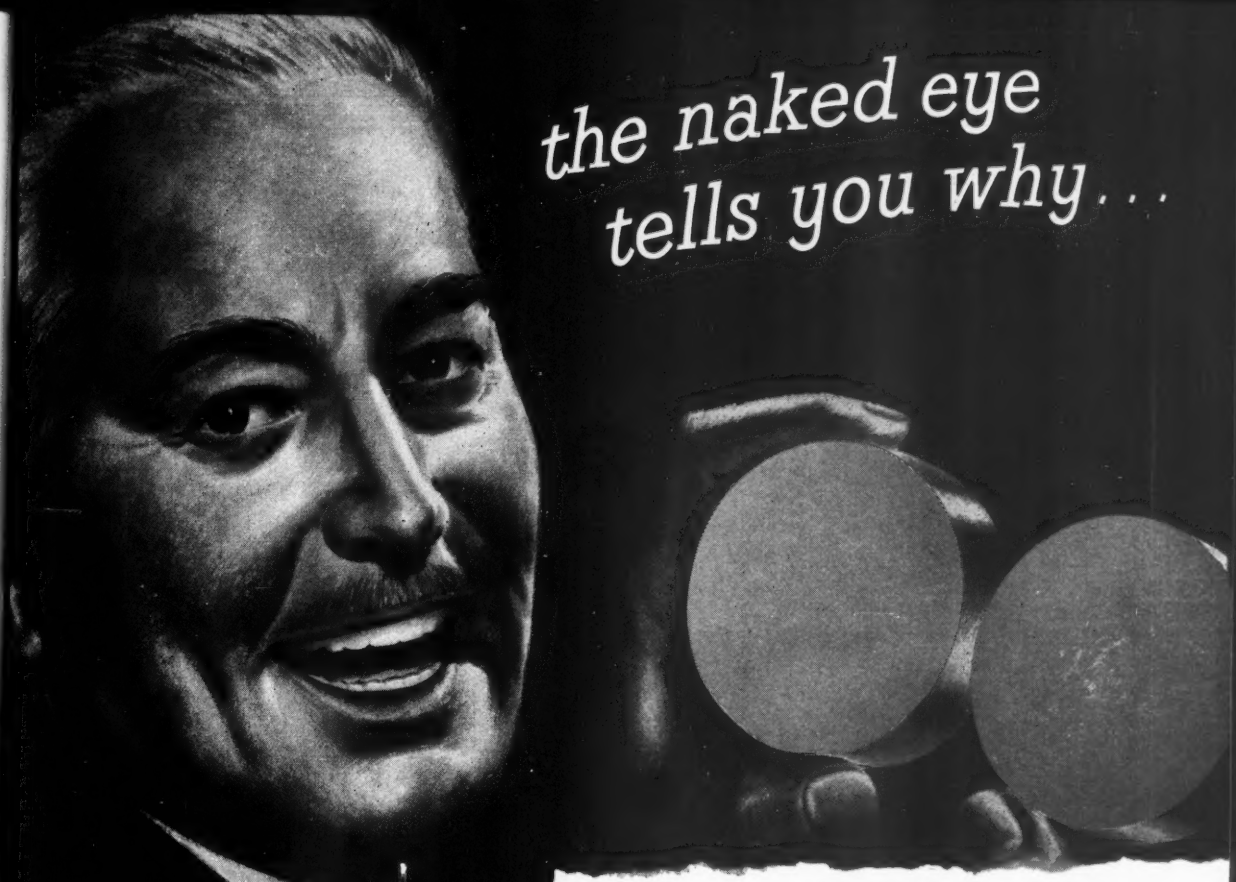

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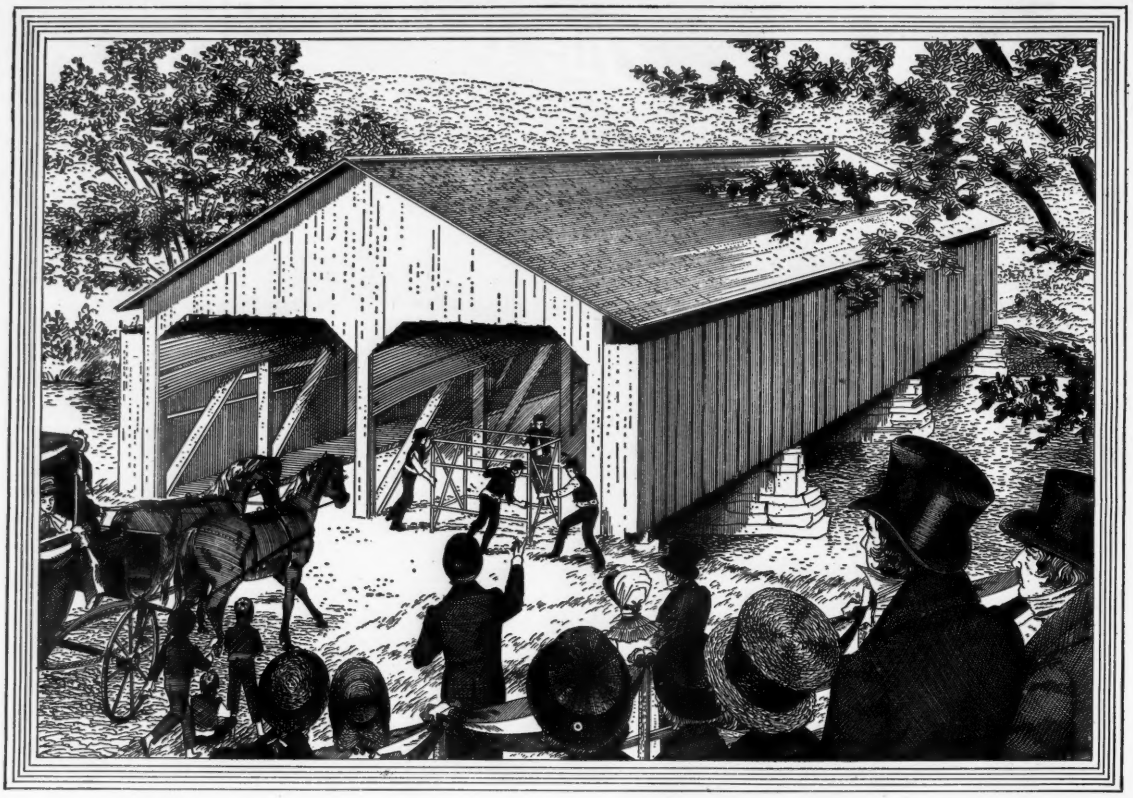


This craftsman's idea still holds up after 148 years!

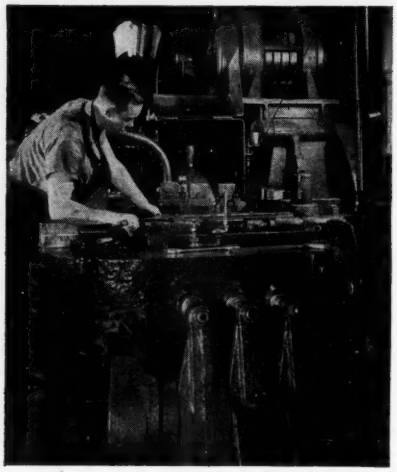
Historic Pulpmill Bridge, Middlebury-Weybridge, Vermont, proves how strong an idea can be.

For engineer Theodore Burr believed a truss could be designed to withstand time . . . built it of "vertical posts and sloping braces with an arch of segments of hewn timber bolted to the frame". Particular care was given to the bolts, which in those days were made by hand, for this craftsman knew that on their holding power depended the safety of the bridge.

The Pulpmill Bridge, built about 1808, strong and in use today, proves how right he was.

Modern construction engineers are even more aware of the value of bolting . . . use high-strength quenched and tempered bolts in place of rivets for faster, more economical field assemblies (write for Fatigue Strength Report). Fortunately, these contemporary craftsmen have *specialists* to aid them, like the RB&W worker in the photograph. He devotes a craftsman's skill to producing bolts, nuts, screws and rivets of uniform accuracy, dependability and physical properties . . . backed by 106 years of RB&W experience in making the finest fasteners.

May we apply our specialized skill to your fastener problems? We have the facilities and the ability to handle them. Address RB&W at Port Chester.



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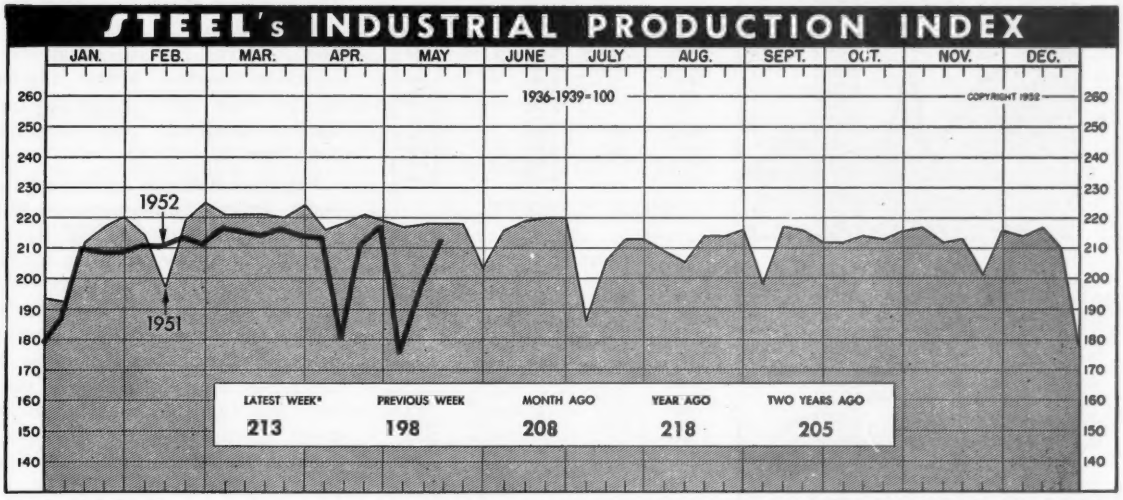
Plants at: PORT CHESTER, N. Y., CORAOPOLIS, PA., ROCK FALLS, ILL., LOS ANGELES, CALIF. *Additional sales offices at:* PHILADELPHIA, DETROIT, CHICAGO, DALLAS, OAKLAND. *Sales agents at:* PORTLAND, SEATTLE. *Distributors from coast to coast.*

The Business Trend



* Week ended May 17

Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.

Business may be at or nearing an economic crossroads as diverse trends continue to shape up. Index has recovered most of the ground lost during the last steel walkout

WHILE MOST assembly lines are moving along at fairly high speeds, the nation may be at or nearing an economic crossroads.

Business men are increasingly at variance in their predictions for the rest of the year. Some say we will see a strengthening, while others hold that we are in for a decline or even an economic tailspin. And another large segment of the forecasters contends that business will continue to move along on its high plateau, slightly under the 1951 levels.

Right now, the nation's plants are maintaining a high output.

Value Up—The market value of the country's output, gross national product, was running at an annual rate of $339.5 billion in the first quarter of 1952, says the Commerce Department. That figure is $5 billion over the previous quarter and nearly $12 billion above the total gross product for 1951.

The greatest push in this upswing, of course, is coming from defense purchases. Military orders constituted 13 per cent of the first-quarter output, compared to 8 per cent for the same period last year. And defense production will play a more important role in the remaining months of this year. Nevertheless, many metalworking executives, watching the drop in demand for consumer durables, are worried about their civilian production. Will this demand lag offset the bolstering influences of defense?

Little Rush — At the moment, refrigerators, stoves and other heavy durables are piling up in the nation's warehouses. The big question is whether the consumer will unzip his wallet and spend now that federal curbs on installment buying are off. So far, there has been little rush on the part of the public to buy on installments. It may be some time before the lifting of the curbs will have effect.

Index Climbs . . .

Reflecting an almost total production recovery from the last steel industry walkout, STEEL's industrial activity index in the week ended May 17 shot up 15 points to 213 per cent of the 1936-1939 average. That's nearly back to the high levels before the steel shutdowns. While steel production rose 20 points, freight car loadings dipped slightly that week. Passenger automobile and truck assemblies showed a slight gain while electric power generation declined.

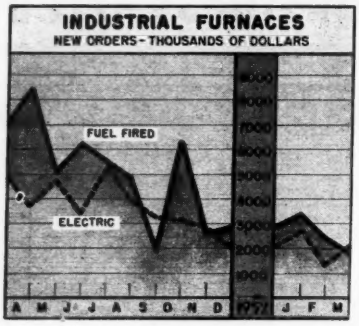
Auto Output Firm . . .

With encouraging April sales reported by dealers and federal installment buying restrictions off, the auto industry is maintaining the high production levels reached at the end of March. After achieving a 120,000-car and truck output during the week ended Mar. 29, U. S. plants have continued producing at that high-for-the-year level in five of the following eight weeks. Now that the Federal Reserve Board has lifted Regulation W, there is even stronger optimism in Detroit concerning prospective sales this summer.

U. S. and Canadian plants turned out 131,695 autos and trucks in the week ended May 17, says *Ward's Automotive Reports*. That's 1186 more units than were assembled during the previous week.

Construction Soars . . .

Construction activity is continuing to maintain the high levels established in the early spring months. Spurred by an increase in industrial building, contract awards for construction totaled

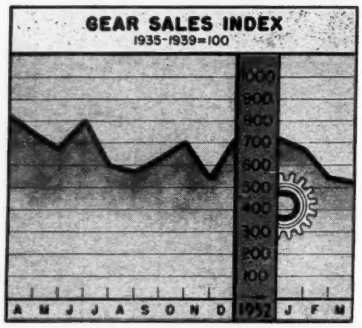


Industrial Furnaces

New Orders—Thousands of Dollars

	Fuel Fired*		Electric	
	1952	1951	1952	1951
Jan.	3,379	4,033	2,856	2,764
Feb.	2,413	4,670	1,363	3,212
Mar.	1,809	7,019	2,100	4,846
Apr.	....	8,497	....	3,657
May	....	5,044	....	4,766
June	....	6,259	....	3,370
July	....	5,303	....	5,587
Aug.	....	4,850	....	3,891
Sept.	....	1,821	....	3,250
Oct.	....	6,374	....	3,172
Nov.	....	2,516	....	2,382
Dec.	....	2,875	....	2,100

* Except for hot rolling steel.
Industrial Furnace Mfrs. Assn.

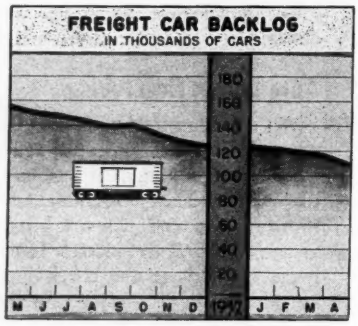


Gear Sales Index

1935—1939=100

	1952	1951	1950
Jan.	670.6	764.6	280.2
Feb.	539.5	809.1	272.9
Mar.	517.1	830.7	358.4
Apr.	....	742.5	328.6
May	....	667.1	363.1
June	....	800.9	401.0
July	....	589.1	410.7
Aug.	....	564.2	617.4
Sept.	....	630.1	654.5
Oct.	....	703.4	564.8
Nov.	....	530.0	554.9
Dec.	....	716.5	680.4

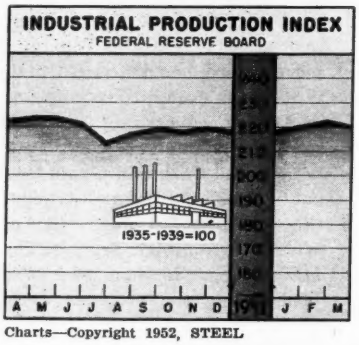
American Gear Mfrs. Assn.



Freight Car Awards and Backlogs

	Awards		Backlogs*	
	1952	1951	1952	1951
Jan.	5,338	26,356	120,251	144,758
Feb.	7,358	15,947	118,900	154,861
Mar.	5,619	11,271	115,854	158,619
Apr.	397	6,628	108,270	155,871
May	....	4,919	.....	150,628
June	....	6,793	.....	147,725
July	....	2,417	.....	144,810
Aug.	....	1,828	.....	139,014
Sept.	....	9,657	.....	140,135
Oct.	....	3,464	.....	132,792
Nov.	....	6,752	.....	129,158
Dec.	....	3,309	.....	123,947
Total	....	96,190		

* End of month
American Railway Car Institute



Industrial Production Index

	Total Production		Iron, Steel		Non-ferrous	
	1952	1951	1952	1951	1952	1951
Jan.	220	221	261	255	215	224
Feb.	222	221	261	252	217	218
Mar.	220	222	262	263	218	212
Apr.	...	223	...	264	...	210
May	...	223	...	263	...	206
June	...	221	...	261	...	204
July	...	213	...	253	...	198
Aug.	...	217	...	254	...	198
Sept.	...	219	...	257	...	201
Oct.	...	218	...	261	...	202
Nov.	...	219	...	261	...	209
Dec.	...	218	...	263	...	210
Avg.	...	220	...	259	...	207

Federal Reserve Board

Charts—Copyright 1952, STEEL

Issue Dates on other FACTS and FIGURES Published by STEEL

Construction .....May 5	Machine Tools .....May 5	Refrigerators Apr.28
Durable Goods .....May 5	Malleable Castings .Apr.14	Steel Castings Apr.14
Employ., Metalwkg. Apr.21	Prices, Consumer...May 19	Steel Forgings .....Apr. 7
Employ., Steel Apr.28	Prices, Wholesale ..May 19	Steel Shipments Apr.21
Fab. Struc. Steel....Apr. 7	Pumps .....May 12	Vacuum Cleaners ...May 5
Foundry Equip. Apr.14	Radio, TV .....May 12	Wages, Metalwkg. ..May 5
Gray Iron Castings.Apr.14	Ranges, Elec. Apr.28	Washers .....May 12
Ironers May12	Ranges, Gas Apr.28	Water Heaters ....May 19

$284.7 million in the week ended May 15, reports *Engineering News Record.* That's a decline of $30 million from award valuation for the previous week, but over the year-ago figure by some $32 million. Awards for industrial construction reached $100.4 million in the week ended May 15, the highest week in this category since Apr. 3.

Private housing is continuing its boom. Private builders started 98,500 dwelling units during April, says the Labor Department. That's an increase of 16 per cent over March and 7 per cent over April, 1951. On a seasonally adjusted basis, the April-March increase in private housing starts exceeds that for 1950 and 1951, but is not as great as the rise for the same months during the earlier postwar years.

Gas Appliances Lag . . .

Shipments of domestic gas ranges are staying at levels substantially under the year-ago figures. Gas Appliance Manufacturers Association reports that gas range shipments totaled 173,600 units in April, under the unit shipments for the same month last year by 51,000. Total range shipments for the first four months of 1952 amounted to 686,000 units, as compared to 1,029,400 units shipped in the comparable months last year.

Gas water heater shipments are also well under the year-ago figures. In April, 156,900 water heaters were shipped, 21 per cent under the year ago movement. Total shipments for the first four months of 1952, amounted to 603,600 units—about 30 per cent under shipments in the same months last year.

TV Shipments Down . . .

Conforming to the general appliance sales pattern, shipments of television sets also fell below last year's levels. During the first quarter of 1952, TV receiver shipments totaled 1,277,512 units, compared with 1,814,767 sets shipped in the corresponding period of 1951, says the Radio-Television Manufacturers Association. March shipments of TV receivers totaled 471,015 sets, representing an in-

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	102.5	82.5	97.0
Electric Power Distributed (million kwhr)	7,085[1]	7,039	6,559
Bituminous Coal Output (daily av.—1000 tons)	1,338	1,425	1,600
Petroleum Production (daily av.—1000 bbl)	N.A.[3]	N.A.	6,177
Construction Volume (ENR—millions)	$284.7	$315.1	$151.8
Automobile, Truck Output (Ward's—units)	131,695	130,509	156,127
TRADE			
Freight Car Loadings (unit—1000 cars)	710[1]	720	809
Business Failures (Dun & Bradstreet, number)	154	150	171
Currency in Circulation (millions)[3]	$28,497	$28,523	$27,287
Dept. Store Sales (changes from year ago)[3]	+6%	−2%	+4%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$15,724	$15,490	$17,345
Federal Gross Debt (billions)	$258.6	$258.4	$254.7
Bond Volume, NYSE (millions)	$14.6	$13.7	$14.9
Stocks Sales, NYSE (thousands of shares)	4,863	5,598	8,577
Loans and Investments (billions)[4]	$73.2	$73.3	$69.4
United States Gov't. Obligations Held (billions)[4]	$31.4	$31.5	$30.4
PRICES			
STEEL's Weighted Finished Steel Price Index[5]	171.92	171.92	171.92
STEEL's Nonferrous Metal Price Index[6]	232.4	238.0	241.6
All Commodities[7]	111.6	111.5	115.0
All Commodities Other Than Farm and Foods[7]	112.9	112.9	116.6

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1951, 1,999,035; 1952, 2,077,040. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100. [8]Not available.

crease over the 434,808 units shipped in the preceding month.

Retail Sales Jump . . .

After stepping up sales promotions for Mother's Day, retailers showed slight gains in sales in the week ended May 10. The Federal Reserve Board reports that department store sales that week rose 6 per cent above the corresponding 1951 week. That's the first substantial rise above the year-ago sales since the Easter sales week ended Apr. 12. Despite the lifting of government curbs on installment buying, few retailers report substantial increases of installment plan purchasing.

Failures Increase . . .

The heaviest toll of business failures in 20 months was recorded in April. Although not so numerous as failures recorded for the same month in 1950 and 1949, company mortalities rose to 780 firms, 13 per cent above the 1951 level, says Dun & Bradstreet. A large portion of the month's rise was in manufacturing.

Prices Slide . . .

Primary market prices in April declined for the sixth consecutive month, according to the Labor Department's Bureau of Labor Statistics. Wholesale prices fell 0.4 per cent between March and April to 111.9 per cent of the 1947-1949 average. The bureau's index for April was the lowest since November, 1950. Wholesale prices of metals and metal products in April were down 0.6 per cent from the year-ago figures, while machinery and motive products fell 2.7 per cent.

Trends Fore and Aft . . .

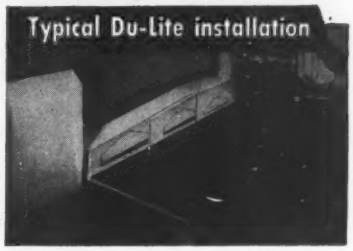
U. S. corporations offered $2.1 billion in new securities in the first quarter, compared with $1.8 billion for the same period last year . . . Workers covered by state unemployment insurance laws totaled 34.8 million, about 2 million over 1950 . . . Due to the petroleum strike, no weekly crude oil production figures are being released . . . Freight car loadings were running 11 per cent below the same 1951 week during the week ended May 10 . . . Repayments on loans by metalworking companies rose $11 million in the week ended May 7. These companies have repaid $1 billion since Dec. 26, 1951. . . . Shipments of truck trailers in March were up 11 per cent in value from February, but 16 per cent below March, 1951. Shipments this March totaled $21 million.

On any steel blackening problem

DEPEND on DU-LITE for a Superior Finish

Courtesy The Poly Choke Co.

Du-Lite gave this part with its complicated knurls, slots, threads, etc, a fine rust-resistant durable black finish. It is typical of many other parts, small and large, which have been black oxidized by Du-Lite for many years. Moreover, Du-Lite meets most individual and government specifications including 57-0-2C for Type III Black Oxide finish.



Du-Lite installations are simple, compact, easy to operate. Du-Lite equipment can be tailored to fit production requirements on all types of jobs with a maximum of speed and economy. Du-Lite also makes a complete line of cleaners, strippers, wetting agents, passivating agents, rust preventatives, burnishing compounds etc. for any metal finishing application.

See your nearest Du-Lite Field Engineer or write for more information.

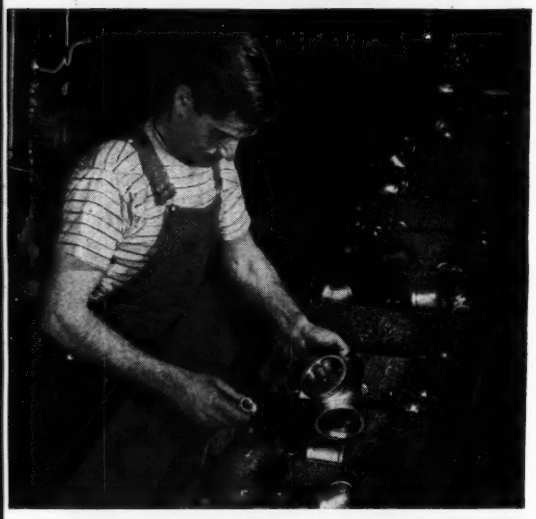
DU-LITE CHEMICAL CORP.
MIDDLETOWN, CONN.

Rush information on your metal finishing products.

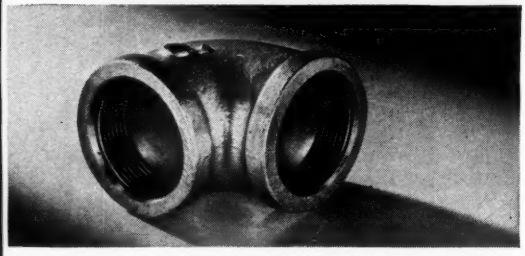
Name.....
Company.....
Address.....
City..... Zone..... State.....

Du-Lite
METAL FINISHING SPECIALISTS

A PIPE FITTING MANUFACTURER had trouble with a straight cutting oil. It made the floors slippery; was suspected of causing skin irritations; discolored the fittings. In addition, a special cleaner and rust preventive had to be used.



CHANGING TO S.E.C.O. brought excellent results. This "Job Proved" emulsifying cutting oil kept the fittings from discoloring, minimized complaints about skin troubles, made floors safe, eliminated the need for a special cleaner and rust preventive.



OPERATIONAL DATA. Machine: 2" automatic tapping machine • Metal: Malleable iron • Operation: Thread and chamfer 1½" 45° elbow • Cutting Speed: 75 SFM • Tools: High speed • Production: 306 pieces per hour • Cycle Time: 11¾ sec.

S.E.C.O. REPLACES THREE PRODUCTS; REDUCES COSTS, MAKES SHOP CLEANER, SAFER

Ten years ago, one of the largest manufacturers of pipe fittings was using a straight cutting oil that proved to be a production headache. It made floors slippery, discolored the fittings, even was blamed by the operators for causing skin ailments.

The company overcame these problems—with extra benefits for good measure—by changing to Sunoco Emulsifying Cutting Oil. S.E.C.O. performed as a quality cutting oil is expected to, and eliminated the need for two costly supplementary products: a special alkali cleaner and a rust preventive. Sprayed on the parts conveyed through the washers, S.E.C.O. left a film that gave complete protection against rusting. Oil costs were reduced to an amazing extent; floors were safe; complaints about skin irritations were minimized and shop morale improved. The pipe fittings, free of discoloration, commanded a better position saleswise. The company standardized on S.E.C.O. and has been using it ever since.

In all machine shop operations, on both ferrous and nonferrous metals, Sun Emulsifying Cutting Oil is definitely superior. That's why more S.E.C.O. is used than all other brands of emulsifying cutting oil combined. For more operational data on typical S.E.C.O. applications, write for a copy of the new "Cutting and Grinding Facts." Department S-5.

SUN INDUSTRIAL PRODUCTS

SUN OIL COMPANY, PHILADELPHIA 3, PA. • SUN OIL COMPANY, LTD., TORONTO AND MONTREAL

SUNOCO®

Men of Industry

ROBERT H. BOBILIN
. . . chief engineer, Davies Supply & Mfg.

Robert H. Bobilin, formerly a member of the engineering staff of Udylite Corp. in Detroit, was appointed chief engineer, **Davies Supply & Mfg. Co.,** St. Louis.

Lyon Metal Products Inc., Aurora, Ill., elected **H. A. Gardner** chairman of the board to fill the vacancy created by the death of **Earl D. Power. H. B. Spackman,** Lyon's president, was elected chief executive officer. **J. M. Olesen,** general sales manager, was elected a vice president. **H. F. Sadler,** vice president, sales of United States Gypsum Co., was elected a director.

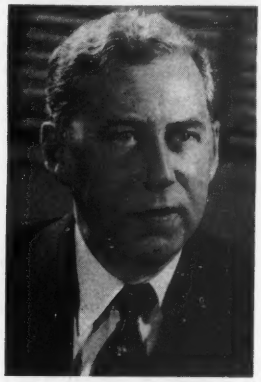
Richard V. D. Strong, formerly Chicago district manager, was appointed chief engineer, **F. J. Stokes Machine Co.,** Philadelphia.

Robert J. Heggie was elected vice president of **A. M. Castle & Co.,** Chicago. Associated with the steel distributing company since 1934, he continues in the capacity of general sales manager. **Harry Falkenberg** was named secretary and controller, and **George R. Winter,** treasurer.

Frederick C. Stakel becomes advertising manager for **Aluminum Co. of America,** Pittsburgh, on June 1.

Dave Heckinger rejoined the sales engineering staff of **Fansteel Metallurgical Corp.** at Chicago.

George D. Sherman was named president, **Orion Inc.,** Bay City, Mich.



ROBERT SHANNON
. . . mgr. of Bliss' Hastings, Mich., div.

Robert Shannon was named manager of the Hastings, Mich., division of **E. W. Bliss Co.** Associated with that division for many years, he most recently served as assistant plant manager. **J. H. Tredinnick,** former manager of the Hastings division, is now executive vice president of the company with offices at company headquarters, Canton, O.

Thomas D. Cartledge was appointed president of **Linde Air Products Co.,** a division of Union Carbide & Carbon Corp., New York. He has been senior vice president of Linde, and a director and vice president of Dominion Oxygen Co. Ltd., a Union Carbide subsidiary.

International Nickel Co. Inc., New York, appointed **Ransom Cooper Jr.** manager, nickel sales department, and **H. D. Tietz,** manager of the Inco nickel alloys department.

Ernest J. Klimczak was appointed chief engineer, secretary and a director, **Ahlberg Bearing Co.,** Chicago.

James W. Hallock succeeds the late **Jackson D. Waterbury** as sales manager of **Albion Malleable Iron Co.,** Albion, Mich.

William F. Langefeld has resigned as director of purchasing at **Austin-Western Co.,** Aurora, Ill., subsidiary, Baldwin-Lima-Hamilton Corp., effective June 1. **James D. McMakin** will assume that position.

JOHN A. McGOWN
. . . new post at GE's X-Ray dept.

John A. McGown was named manager of quality, standards and manufacturing engineering, X-Ray department, **General Electric Co.,** at Milwaukee. His previous post was that of manager of the newly created manufacturing engineering section.

Paul E. Shroads was appointed a vice president of **National Steel Corp.,** Pittsburgh. He continues to serve as controller and assistant treasurer.

J. P. McArthur was appointed manager of Worthington Corp.'s Philadelphia district sales office to succeed the late **W. J. Daly.** Mr. McArthur was regional manager of West Coast sales and is succeeded by **H. W. King. P. L. McManus** was appointed manager of the San Francisco district office.

George M. Bunker was elected chairman, **Glenn L. Martin Co.,** Baltimore, to succeed **Glenn L. Martin,** resigned, but who was named honorary chairman. Mr. Bunker continues as president. Elected vice presidents are **Jess W. Sweetser, J. B. Wharton Jr., W. B. Bergen, C. C. Pearson** and **G. T. Willey. Earl Uhlig** becomes controller, **W. L. Lucas,** treasurer and **F. S. Cross,** secretary.

H. Everett Smith is the new president of **Wilcox-Gay Corp.** and Garod Radio Corp. of Charlotte, Mich., and Brooklyn, N. Y. He succeeds **Leonard Ashbach,** who continues

as chairman of the board of directors and chief executive officer of the companies.

Dumas Steel Corp., Pittsburgh, appointed **Lester J. Andregg** manager of operations. He has had a wide and varied career in the steel industry.

W. C. Whitehead was named acting general manager, **Garrett Corp.**, Los Angeles, in the absence of **J. C. Garrett**, president. He continues as vice president and manager, Airsupply division.

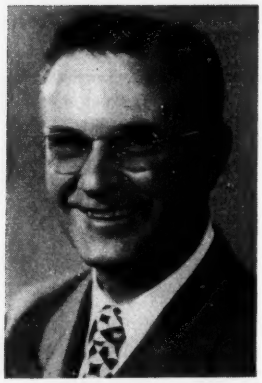
Harold A. Krueger was appointed manager of **St. Louis Smelting & Refining Division**, National Lead Co., where he has been production manager since 1950.

William H. Franklin, comptroller, was elected vice president and secretary, **Caterpillar Tractor Co.**, Peoria, Ill., effective July 1. He succeeds **E. Bornstein**, retired. **A. N. Whitlock** becomes controller.

A. G. Handschumacher, vice president, was elected director of sales, **Lear Inc.**, Elyria, O. **A. F. Haiduck** becomes general manager, Grand Rapids, Mich., division, while **Harold C. Andrus** will manage the Elyria division, with **Le Roy Barr** as assistant general manager.

John C. Sharp was elected president, general manager and a director of **Hotpoint Inc.**, Chicago. He succeeds **James J. Nance**, resigned to become president of Packard Motor Car Co. Mr. Sharp, who has been with Hotpoint for 23 years, was vice president and chief engineer and also served on the management executive committee.

FOSTER H. PETTAY
. . . new V. P. of Ohio Crankshaft



CHESTER H. KIMMEL
. . . new V. P. of Ohio Crankshaft

Ohio Crankshaft Co., Cleveland, elected **Foster H. Pettay** and **Chester H. Kimmel** vice presidents. Mr. Pettay joined the company in 1941 as assistant secretary and became a director in 1951. Mr. Kimmel joined the crankshaft and camshaft division in 1940 and since 1946 has been its general manager.

Karl K. McGarvey was appointed sales manager of equipment sales, **AC Spark Plug Division**, General Motors Corp., at Flint, Mich.

Inland Steel Container Co., subsidiary, Inland Steel Co., Chicago, promoted **Thomas R. Nugent** to the newly created position of sales consultant, and named **Gordon L. Sheehan** as successor to Mr. Nugent in the position of central regionl sales manager.

John B. Girdler was appointed sales manager, **Vanadium Corp. of America**, with headquarters in New York. He was regional manager at Pittsburgh. **Harry E. Orr** was named assistant vice president and manager of engineering sales with headquarters in Chicago.

Independent Pneumatic Tool Co., Aurora, Ill., appointed **J. A. Hill** manager of industrial sales; **J. F. Corkery**, manager of electric tool sales to succeed Mr. Hill; and **G. A. Thoma**, sales promotion manager to succeed Mr. Corkery.

C. Duff Brown was appointed works manager, **Duff-Norton Mfg. Co.**, Pittsburgh. He will supervise plant operations for the Jack Division. He was superintendent of engineering, McKinney Mfg. Co.

Edward Valves Inc., East Chicago, Ind., appointed **Joseph E. Foley Jr.** manager of sales promotion and advertising. He was formerly with American Brake Shoe Co.

Harry C. Brainard was appointed chief metallurgist, **Cleveland Chain & Mfg. Co.**, Cleveland, one of the Round Chain Cos. He assumes direction of the metal development

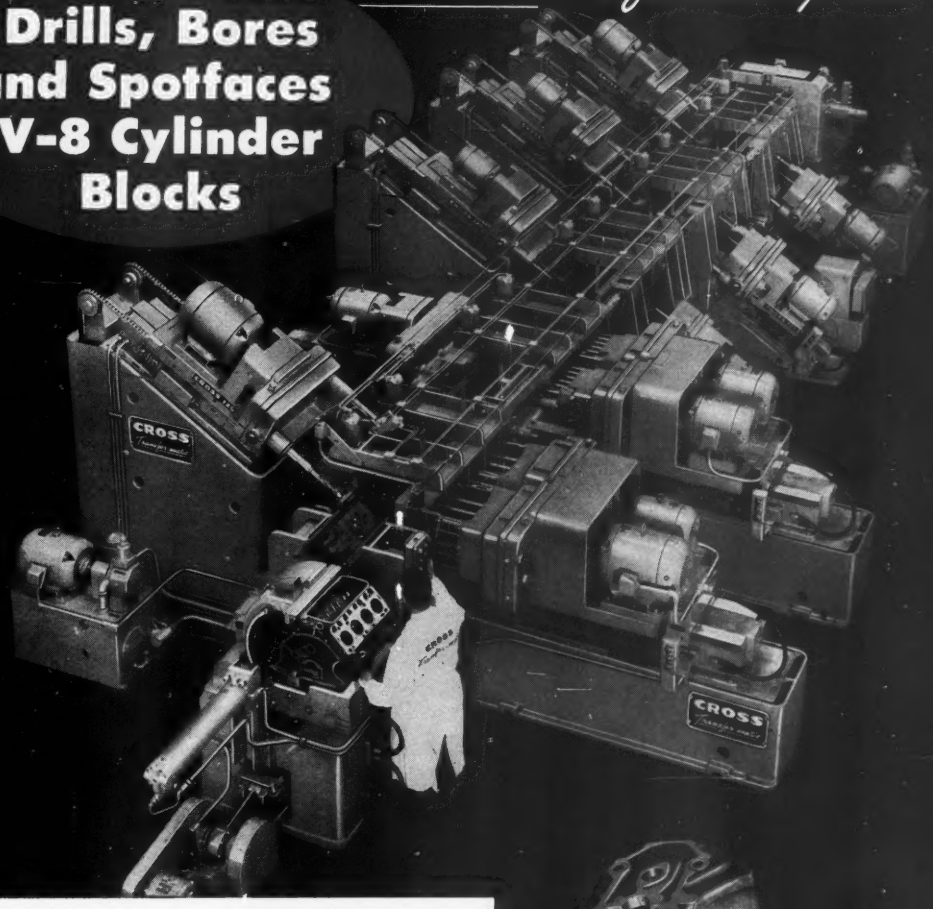
JOHN C. SHARP
. . . new president of Hotpoint

JOHN B. GIRDLER
. . . sales mgr. at Vanadium

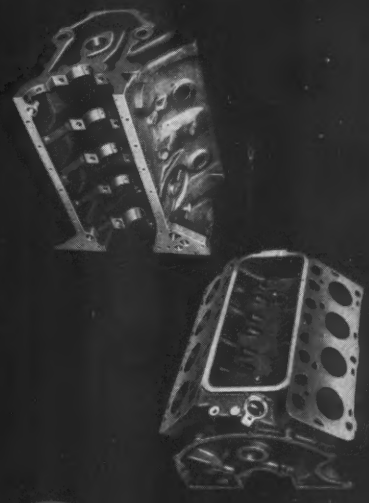
HARRY C. BRAINARD
. . . chief metallurgist, Cleveland Chain

Another Transfer-matic by Cross

Drills, Bores and Spotfaces V-8 Cylinder Blocks

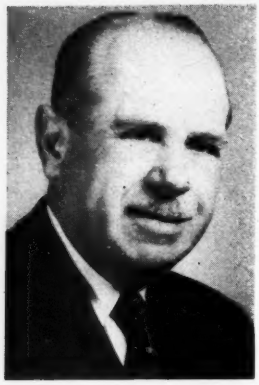


★ Drills, bores, spotfaces and reams 120 V-8 cylinder blocks per hour at 100% efficiency.
★ 19 stations—one for loading; ten for drilling, boring, reaming, countersinking and spotfacing; two for gaging; one for cleaning; four idle; one for unloading.
★ J.I.C. standard hydraulic and electrical construction with stranded wire.
★ Hydraulic locating, clamping, positioning and transferring.
★ Cross Machine Control unit to automatically stop machine when tools need changing.
★ Pre-set tools.



Established 1898

THE CROSS CO.
DETROIT 7, MICHIGAN
Special MACHINE TOOLS



A. E. DORN
. . . new position at Allis-Chalmers

WILLIAM L. WEARLY
. . . Joy Mfg. gen. sales V. P.

R. W. OWENS
. . . elected senior V. P. at Elliott

program and also will supervise quality control.

A. E. Dorn was named industrial sales manager, tractor division, **Allis-Chalmers Mfg. Co.**, Milwaukee. He succeeds **R. M. Stone**, resigned to become associated with the **Allis-Chalmers** industrial dealership in St. Louis. **L. W. Davis**, Oakland, Calif., branch manager, succeeds Mr. Dorn as Pacific Coast territory manager.

B. E. McArthur, chief engineer, was appointed vice president, engineering, of **Magnethermic Corp.**, Youngstown. **John E. Silvasy** was appointed chief mechanical engineer, and **J. A. Hartman Jr.** becomes sales engineer.

Richard S. Huxtable was elected a director of **National Tool Co.**, Cleveland, to replace **Fred V. Gardner**, resigned. Mr. Huxtable is executive vice president and general manager, Fawick Airflex Co. Inc., Cleveland.

Joy Mfg. Co., Pittsburgh, elected **William L. Wearly** general sales vice president in charge of all domestic sales, including Canada and Mexico. He was vice president, coal machinery sales.

Sheffield Steel Corp. appointed **W. S. Newell** sales manager of its Houston office, replacing **R. H. Startzell**, resigned.

Kaiser Steel Corp. appointed **Edward J. Duffy** assistant to the works manager, Fontana, Calif., mill, in charge of iron ore and coal production at Eagle Mountain, Calif., and Sunnyside, Utah. He is succeeded by **Barney Dagan** as general superintendent, Fontana mill.

Gilbert H. Hoffman was named comptroller, **Automatic Sprinkler Corp. of America**, Youngstown. He formerly was executive vice president, Bill Jack Scientific Instrument Co., Solana Beach, Calif.

R. W. Owens was elected senior vice president, **Elliott Co.**, Jeannette, Pa. He joined the company in 1944 as assistant to the president, and late that year was elected vice president of manufacturing.

A. R. Purdy Co. Inc., Lyndhurst, N. J., steel and aluminum warehouse, elected **Arthur R. Purdy Jr.** as president and **Ralph W. Shaw Jr.** as executive vice president.

Claymont Steel Corp., Claymont, Del., appointed **Willis H. Good** manager of plate sales to succeed **A. W. Williams**, retired; and **A. W. Stagg** as purchasing agent to succeed **P. H. Leinheiser**, now consulting purchasing agent. **Carl Sweet** becomes assistant purchasing agent.

William T. Powell becomes president, **Emsco Derrick & Equipment Co.**, Los Angeles, on July 1 when he will succeed **Hugh H. Glen**, who becomes chairman of the board.

OBITUARIES...

William L. Clark, 73, a vice president, **J. I. Case Co.**, Racine, Wis., died May 16. He has been partly retired for the last year.

Russell Hunt, 71, retired vice president of sales, **Sloss-Sheffield Steel & Iron Co.**, Birmingham, died Apr. 18.

George H. Bendell Sr., 60, factory superintendent at Joliet, Ill., works, **American Steel & Wire Co.**, died May 16 of a heart attack.

P. W. Giffard, 44, manager since 1944 of design and development of **Kelvinator** division, Nash-Kelvinator Corp., Detroit, died May 12.

John J. White, 69, founder and president, **Tube Reducing Corp.**, Stamford, Conn., died May 15.

Henry D. Crowe, 56, production manager, **General Cable Co.** at Perth Amboy, N. J., died May 12.

Robert L. Hallett, 70, chief chemist from 1938 to 1948 for **National Lead Co.**, New York, died May 15.

Richard J. Preston Sr., 69, manager of the western sales office, Chicago, of **National Acme Co.**, died May 14.

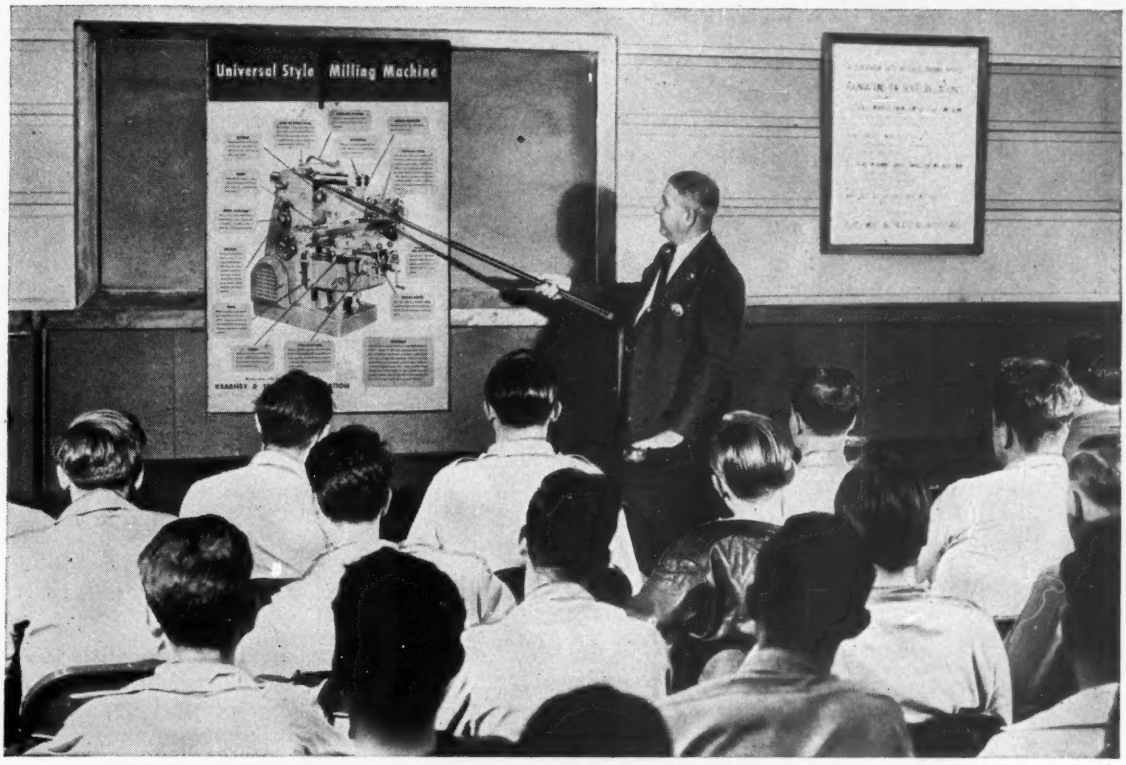
James L. Browne, 66, New York city traffic manager, **General Motors Corp.**, for 30 years, died May 14.

Walter G. Blume, 54, who directed the sale of stainless steel for **Superior Steel Corp.**, Carnegie, Pa., died May 18.

George A. Katzer, 53, general sales manager, **National Twist Drill Co.**, Detroit, died May 4.

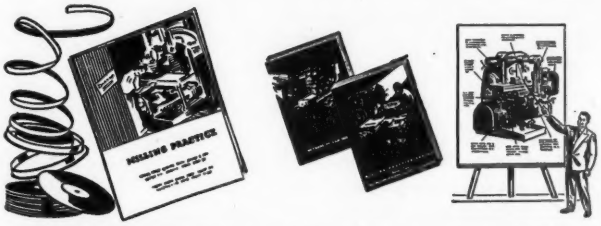
Wendell H. Welch, 49, general operations manager, **Chrysler Corp.'s** export division, Detroit, died May 11.

HOW TO SPEED UP TRAINING OF MILLING MACHINE OPERATORS



Kearney & Trecker visual training aids can

Save time training operators . . . Help train supervisory personnel . . . Improve vocational school machine shop courses



FILM COURSE — We will loan you, without charge, a complete sound-slide, five-part training film (in color) which deals with good machine tool practice. Special emphasis on the use and purpose of the milling machine. Complete with instructor's guide.*

ELEMENTARY HANDBOOKS — Book I, "The Right and Wrong in Milling Practice," covers operation of the milling machine including job setup, taking the cut, selection and care of cutters, housekeeping and safety precautions.

Book II, "The Milling Machine and Its Attachments" covers the principles of milling machine design, construction and attachments.

Books I and II are 50 cents each. Make remittance out to Kearney & Trecker Corp., Milwaukee 14, Wisconsin. Check or money order.* No C.O.D.'s or stamps please.

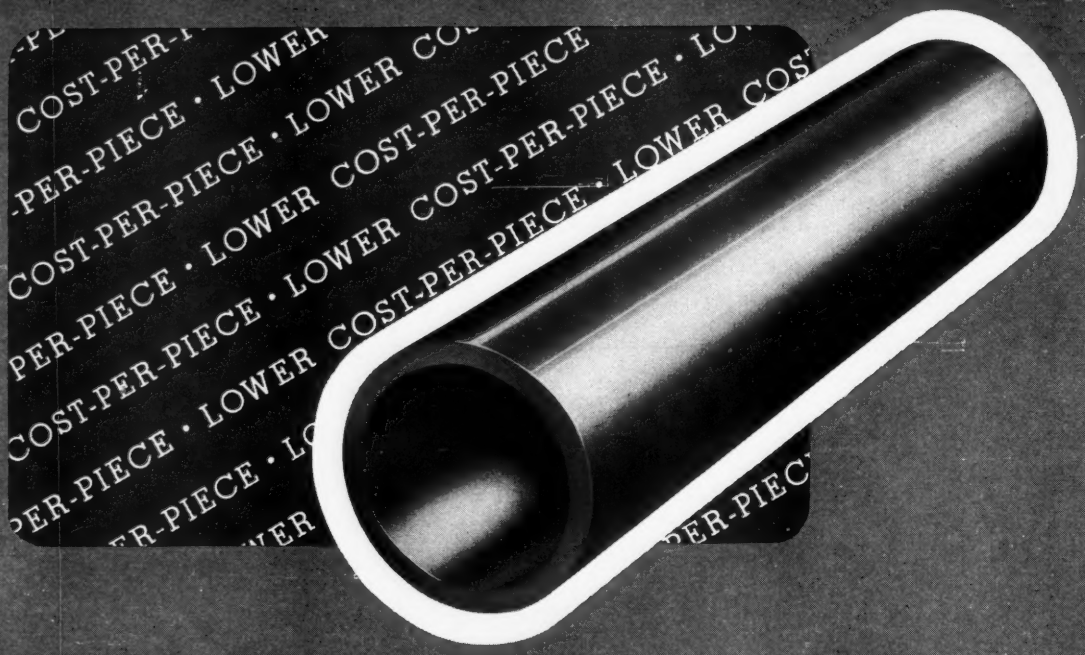
POSTER STUDYVIEW OF UNIVERSAL STYLE MILLING MACHINE — This big 40" x 60" color studyview of a universal milling machine gives the beginner a clearly defined illustration of the machine, its construction and elements of operation and maintenance. No charge.*

**All applications should be made on official company or school letterhead. Trainees can make individual purchases of Books I and II without official letterhead. Instructors can make group purchases of Books I and II.*

As a service to industry and education, Kearney & Trecker offers three popular visual aids to complement your training of milling machine operators.

These visual aids can help you train operators faster . . . do a more complete job. They help you do the kind of training that saves money out in the shops — speeds up schedules and minimizes costly mistakes. Look over the descriptive material below and send for the ones that can help you. Kearney & Trecker Corp., 6784 West National Avenue, Milwaukee, Wisconsin.

KEARNEY & TRECKER MILWAUKEE MACHINE TOOLS


COST-PER-PIECE · LOWER COST-PER-PIECE · LOWER COST-PER-PIECE · LOWER COST-PER-PIECE · LOWER COST-PER-PIECE · LOWER COST-PER-PIECE · LOWER COST-PER-PIECE

BROACH REDESIGN *ups cost 16% . . . but* SAVES *$880.00 monthly!*

DETROIT BROACH CAN CUT YOUR COST-PER-PIECE *by*

1. Developing broaching set-ups to replace other, more costly machining methods.
2. Redesign present broaches and broaching set-ups to make them more efficient.

Review of present broaching operations by qualified specialists can usually increase broaching efficiency. An example is the broaching set-up for the 1½″ inside diameter of the 8″ long, soft steel tube above. Here is what happened when Detroit Broach engineers studied the broaching set-up.

By changing the tool design, the number of sharpenings per tool was increased 26%. Change of steel and heat treat, as well as improved manufacture of the tool, upped the number of pieces produced per grind 46%. Thus, even though original cost was increased $18.00 per tool, cost-per-piece was reduced 50% . . . *a net saving of $880.00 per month!* In addition, reject rate for the operation was cut from 11% to 3% due to the substantial improvement in surface finish on the parts.

This is a typical example of how Detroit Broach specialization pays off . . . in ingenuity that comes only with singular familiarity with all phases and types of broaching. Whether yours is a new broaching application or raised sights on a present one . . . consult Detroit Broach for actual cost and production data.

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Production AND Engineering
NEWS AT A GLANCE

FLOATS WHILE IT DRIVES—By applying power directly to a roller shaft, a new floating worm gear-motor, developed by Reliance Electric of Cleveland, extends direct application of power to roller conveyors employed in handling metals in strip, bar and other forms of rolled products. Its function is to produce necessary torque at low speeds—lower than that obtained by a direct motor drive. Unit is designed so shaft of the hollow worm gear can be slipped over the extending shaft of the roller. A restraining device keeps the motor from rotating around the roller shaft. Development eliminates need of separate gear reducers and couplings, and even though the roller itself should become warped or its shaft bent, it will drive without difficulty since it literally floats.

TWO-WAY SAVINGS—A British metal pretreatment discovery which is said to save metals by retarding corrosion longer, and save paint by requiring less of it, is now being made available through the Eastern Jenolite Distributing Co., Cleveland. Widely used in England by the War Office, Air Ministry, Ministry of Supply and Ministry of Works, the development has the faculty of derusting, descaling, phosphating, rustproofing and keying metal surfaces for paint adhesion all in one operation. It can be applied by dipping, spraying or brushing without necessity of neutralizing metal surfaces.

ORE TO METAL IN HOURS—Two results—more metals from the same sources and lower costs of production—are predicted because of new techniques of treating ore concentrates by chemical methods instead of the usual smelting and refining procedures to produce pure metals. The new treatments extract pure nickel, copper and cobalt from ore bodies with lower metal content, cut costs by reducing metallurgical treatment and lowering present time lag between mining and pure metal from months to a matter of hours. p. 76

MISSING RESEARCH LINK—Lack of opportunity for developmental personnel to follow their equipment through operational stages is a weakness in the nation's military research efforts, points out John N. Dyer, vice president and director of research, Airborne Instruments Laboratory. He says problems arising in the use of a new device are often as important to its success as those solved in its development.

THEY LIVE TO WORK AGAIN—Worn out screw drivers, obsolete drills and thousands of other "tired" tools are rehabilitated to serve again in Chrysler's plants. Last year more than 100,000 factory tools headed for the scrap pile were reworked to meet new specifications under the program. Those unworkable are shuttled to other departments, or sold to Chrysler suppliers for allied use. Only those beyond any salvage are sent to the scrap pile. p. 79

STOPS THE LEAKS—The Navy seems to have one success after another with plastic materials. Latest development is a plastic patch for pipes which not only can be applied in about 7 minutes, but also can withstand working pressure 20 minutes after application. Developed at the Naval Damage Control Training Center, Philadelphia, the patching material consists of fibrous glass cloth, resin and activator and glass tape. No surface preparation other than wiping dry is required. The patch will work over jagged ruptures or sunflower bursts. It even will join two ends of completely severed pipe. No outside heat is required in the application.

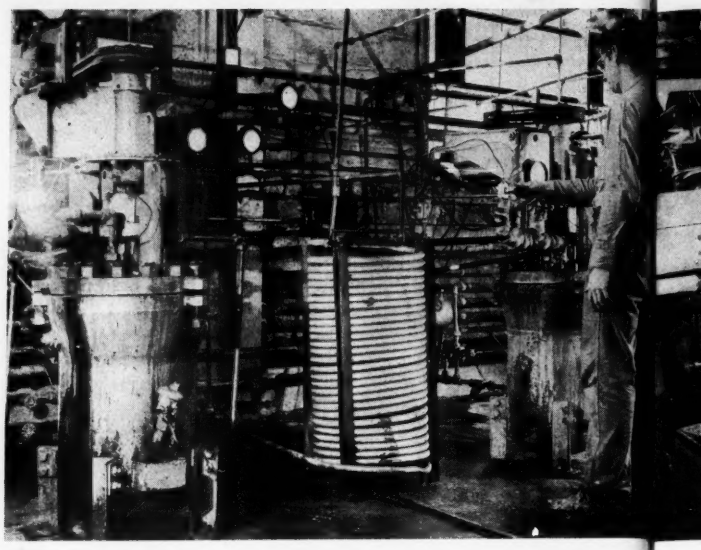
GOAL: TEN-CENT GEAR—Although no process exists for producing hot pressed metal powder mechanical parts rapidly on a commercial scale, it doesn't mean the path to a ten-cent gear is blocked. Method is steadily gaining ground through research and, in time, may bear fruit in the form of a fine array of products complementing the variety of parts continuously being developed by the normal cold pressing and sintering techniques. Already it is being used successfully on high-priced materials where cost of production is secondary. p. 80

BOTTLENECKS TALENT—Poor communication between engineers and top management is causing an estimated loss of 60 per cent of the potential managerial talent of engineers, the National Society of Professional Engineers reports. Survey of 350 companies employing some 50,000 engineers discloses that only 34 per cent of the companies have any planned program of information to prepare engineers for management leadership.

VISITS PAY OFF—Remember the visits of the British Productivity Teams late in 1949 and early 1950? Perhaps those American companies whose plants were visited by these teams wondered what the results were, if any. In making an assessment of the visits, the Anglo-American Council on Productivity says a number of individual British forges and foundries reported increase in productivity, in part the result of changes made in accordance with team recommendations. Since 1949, for example, one steel foundry, increased productivity of labor by some 10 to 11 per cent; one cut man-hours per ton of castings by more than 11 per cent. Another steel foundry increased output of its molding shops by 41 per cent, and another reduced man-hours per ton of output by 47 per cent. A drop forger increased output per man-hour of hammermen by 40 per cent, another's output per man-hour rose 23 per cent. At still another's the output per man-year increased 33 per cent.

Metalworking Outlook—p. 39 *Market Outlook—p. 151*

Copper scrap process begins with lowering a basket of scrap into a leaching solution where it will dissolve



Two coils for heat exchange. Heat from precipitated copper leaving autoclaves is transferred to solution

Lower Production Costs?

PURE METALS FROM ORE CONCENTRATES

Chemical process for extracting pure nickel, copper and cobalt from ore concentrates will permit economical mining of ore bodies with lower metal content

CURRENT costs of producing metals may be drastically reduced by new techniques developed by Chemical Construction Corp., a subsidiary of American Cyanamid Co., New York. The processes involve treatment of ore concentrates by chemical methods instead of the usual smelting and refining techniques to produce pure metals. Several of the many applications are scheduled for commercial use. In collaboration with Sherritt Gordon Mines Ltd., a nickel-copper-cobalt process has been researched and piloted for that company's Lynn Lake properties. Processes were tailored for the cobalt concentrates of Howe Sound Mining Co. and National Lead Co.

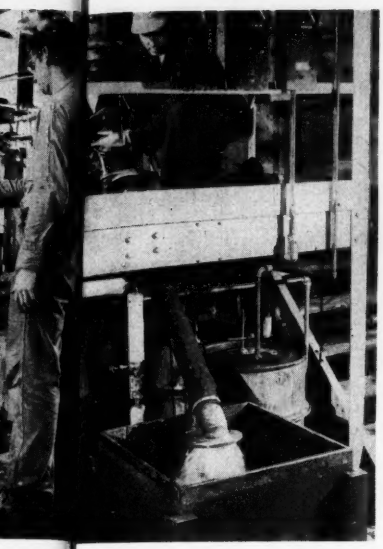
William N. Porter, Chemico president, points out that lower metals prices will not necessarily be the immediate effect of the new processes because of the insistent demands for metals. However, reduced metallurgical treatment costs, he says, will permit the economical mining of ore bodies with lower metal content. This, in turn, will permit increase in metals production to meet today's high demands.

Piloting experience indicates that production cost, from ore concentrates to pure metals, should be considerably below current costs. Other savings may be realized by cutting transportation and personnel costs, and by reducing the present time lag between mining and pure metal from months to a matter of hours.

40% More Cobalt—First commercial use of one of the processes will begin this summer when Chemico expects to complete the building of a $2½ million cobalt refinery for Howe Sound Mining Co. near Salt Lake City, Utah. This plant will boost world output of the strategic metal, most of which comes from Central Africa, by more than 40 per cent. The plant will daily process 35 tons of 20 per cent cobalt concentrates from Howe Sound's Blackbird Mine near Cobalt, Idaho, resulting in yearly production of 2000 tons of pure cobalt, about one-half the United States' consumption of the metal in 1950.

Also under construction at the Fredericktown, Mo., mine of National Lead Co. is a $5 million refinery scheduled for completion in mid-1953. With a designed capacity of 50 tons of concentrate per day, National Lead Co. plans to maintain an annual production at this plant of 700 tons of cobalt, 900 tons of nickel and 700 tons of copper plus 7500 tons of fertilizer-grade ammonium sulphate.

A $17 million nickel refinery is under construction for Sherritt Gordon Mines Ltd. at Edmonton, Alberta, in which the Sherritt Gordon ammonia leach process and Chemico's nickel reduction process are combined. The plant, scheduled to begin operation in the fall of 1953, will turn out mostly nickel



Water and powdered copper pour out of the tank into box filter for drying

Copper powder pours from rotary drier — the last step in the process

and small quantities of cobalt and copper from sulphide ores mined at Sherritt Gordon's Lynn Lake holdings at Manitoba. Annual production at the refinery is expected to be about 8500 tons of nickel, 1000 tons of copper and 150 tons of cobalt, plus 70,000 tons of ammonium sulphate. This will be the only major nickel refinery in the Western Hemisphere besides the large International Nickel Plant located at Port Colborne, Ont., Canada.

Copper Powder from Scrap—A development that may soon find commercial application is a new process for production of pure copper powder from any form of copper scrap, brass scrap or blister copper. It achieves virtually 100 per cent extraction. The product, better than 99.9 per cent pure, meets all standards for oxygen-free, high-conductivity electrolytic copper. The process was accomplished by Chemical Construction during two years of close collaboration with Chemetals Corp.

In converting from the old smelting and refining methods to these newly developed processes it is expected that costs of scrapping existing facilities in many cases can be made up in about three years from operating savings. Smelters and refineries are now often hundreds of miles apart, and time lags in production extending over many months, frequently result in huge inventories of partially processed material.

Months to Hours—Cost of maintaining the intermediate inventories, hazards of forecasting metals prices months in the future, plus wasteful smelting and refining dislocations are expected in most cases to be eliminated by the new processes. They permit so close an integration of the time factor, that it is a matter of hours rather than months between the mining of the ore and production of a pure metal ready for market. Refiners using the new processes will prepare a concentrate of the ore by conventional flotation methods, introduce the concentrate as a slurry into an autoclave along with water and an acid or ammonia and then, from the resulting leach solution, recover the individual metals by the use of suitable reducing agents.

By varying conditions during the treatment, the different metals in the ore are produced separately as pure powders, which may be pressed into forms ready to market, or, in the case of copper, extruded as rods or pipe. The reagents are generally recovered.

Processes are the result of seven years' research by Chemico and four years' research and pilot plant work by Sherritt Gordon.

Metals: Speed Block

Overcoming the heat barrier is a primary target in planning supersonic flights

AIRCRAFT engineers are beginning to wrestle with the problem of heat that must be solved before airplanes and missiles can hope to succeed at predicted speeds of 2500 mph.

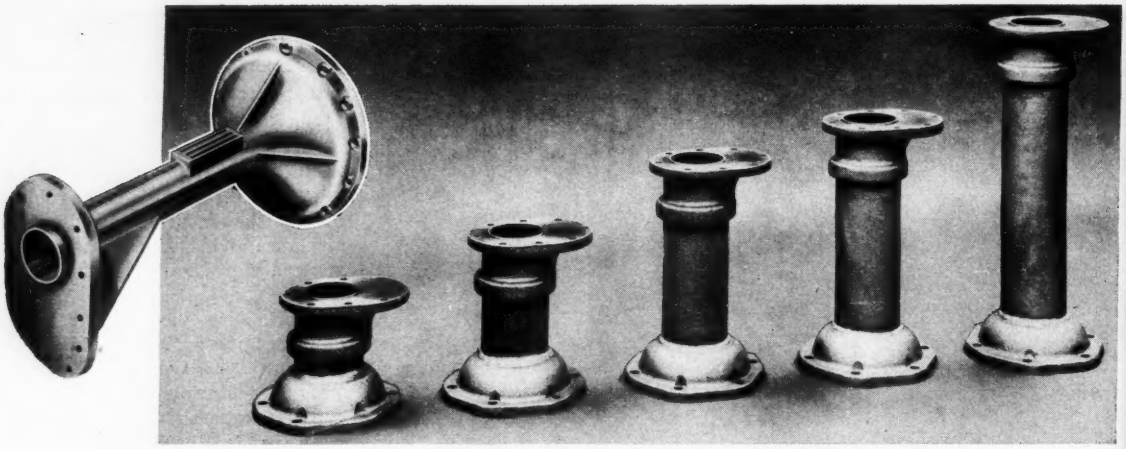
R. H. Rice, vice president and chief engineer, North American Aviation Inc., Los Angeles, says present materials and equipment are inadequate for contemplated operating conditions. These include flights at twice the speed of sound at about 40,000 feet—where the temperature on a normal day hangs at —65° F.

Aluminum Sags—At these sustained speeds, the engineer states tough aluminum relaxes and loses much of its strength. Today's cockpit canopy material achieves a putty-like consistency. Other possibilities of failure include loss of radar to the pilot and distortion in remaining electronic equipment.

Mr. Rice predicts planes in the future capable of supersonic flight will require refrigeration systems to cool both electronic and hydraulic systems. He reports new hydraulic oils are already being sought and metals capable of withstanding far greater heats than are credited to aluminum will have to be developed. The engineer suggests the answer to an answer to the metals problem may be uncovered among the titanium alloys.

Short Supply—North American uses titanium in designing many of its fighter components, but the metal is in short supply. At present, heavier aluminum or stainless is incorporated to compensate for loss of strength at high speeds and consequent high temperatures.

At 200° F aluminum loses only 10 per cent of its strength; but at 250° F it loses 40 per cent. Thus, 40 per cent more metal must be used for a plane flying any appreciable length of time at speeds causing a fully stabilized temperature of 250° F. This means more weight—a factor that the engineer is dedicated to eliminate.



Original design for drive spacer castings called for parts cast in one piece (left). Redesign permitted use of same simple machined steel castings on both ends of all sizes, welded to pipe of proper length. Steel requirement was reduced 30 per cent

Casting Redesign May Result in Multiple Savings

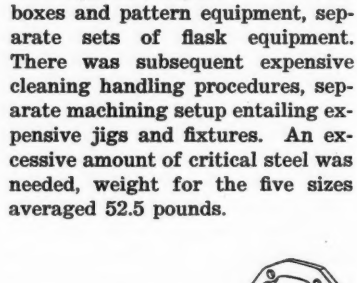
Lower costs, reduced weight and better appearance of parts, improved castability can be achieved by redesigning castings. Net result is savings for foundry and customer

ECONOMICAL production, improved engineering of parts, advances in functional or physical design characteristics, better producibility, greater dependability, and other tangible gains are among results of foundry engineering. Graphic case records are available in the product development files of Steel Founders' Society. Typical company is Superior Steel & Malleable Castings Co., Benton Harbor, Mich. There correct structural design compatible with good foundry practice is of paramount importance. Lower costs, reduced weight and better appearance of parts, improved castability have been achieved.

Experience of the company, comparable to experience of other steel castings producers demonstrates that foundry-engineered products result in substantial savings for foundry and customer. Savings range from 15 per cent to more than 38 per cent. Customer relationships are firmly cemented on a co-operative basis.

One foundry solved problems in the production of tractor drive spacer parts in which the strength, shock and fatigue resistance, and stability of cast steel were considered indispensable.

Designed to meet five different size requirements, drive spacer units, were expensive to produce as one-piece steel castings. Each size required a separate set of core boxes and pattern equipment, separate sets of flask equipment. There was subsequent expensive cleaning handling procedures, separate machining setup entailing expensive jigs and fixtures. An excessive amount of critical steel was needed, weight for the five sizes averaged 52.5 pounds.



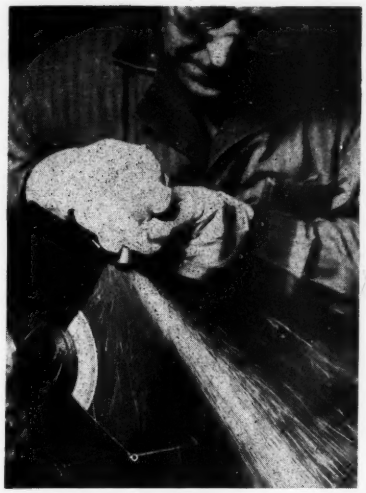
Size of finished drive spacer casting depends only on length of pipe cut, then welded to standard end casting

Welded Assembly—Working together customer and foundry's engineers made design changes. Redesign led to use of two simple machined steel castings plus one piece of pipe which could be cut to required length and welded to the steel castings for each of the five sizes of drive spacers.

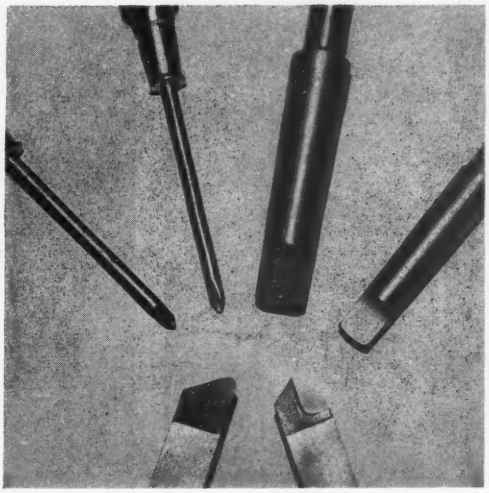
Direct result is production of parts at greatly reduced cost, and valuable conservation of critical metal. Total cost of the part was reduced 38.4 per cent, and 30 per cent less steel was required. Weight was cut to 37.1 pounds.

Teamwork on design eased problems in the production of cast steel hydraulic cylinder heads. As made to customer specification, head castings developed leakers. Casting was expensive to produce. Cores were expensive and difficult to hold in place during operation.

Castings Simplified — Analysis indicated need for elimination of uneven metal sections, and showed that weight must be decreased. Provision must be made to secure better anchorage of cores, and molding and cleaning must be made simpler and less expensive. Redesign of the part brought an end to the problems, and a cost reduction of 18.3 per cent. Added gain was the elimination of excess metal.



Spark testing of worn-out tools indicates type of metal so tool can be separated into 25 different classifications for systematic scrappage



Examples show how worn-out tools can be made useful. Screwdriver was resharpened, drill had shank reworked, tools refitted to another job

Storeroom for obsolete tools is source for retired tools often found suitable for other jobs. Purchase requisitions are checked by control department

Scrap Pile Cheated

NEW LIFE FOR TOOLS

Useful lives of worn out or obsolete tools are extended by Chrysler's program of rehabilitation and salvage conducted by the nonproductive material control department

MORE THAN 100,000 factory tools headed for "retirement" were put through a reconditioning process by Chrysler Corp. last year to extend their useful lives several times beyond normal. Worn-out screwdrivers, obsolete drills and thousands of other "tired" tools are reworked to conform to new specifications. Others are reissued to other departments of the company where they can be used effectively for other purposes; still others are sold to Chrysler suppliers who can use them in their operations, and, finally, those that cannot be repaired or reclaimed in any way add to the tonnage of Chrysler's scrap metal drive.

Savings in the Thousands—Last year 70,000 separate items were supplied to plants from obsolete tool stores or surplus stocks held by other plants, and another 3600 were reworked to fit new specifications. Savings ran into thousands of dollars. In another separate operation 24,000 grinding wheels were either reworked to provide fresh surfaces or substituted for other functions.

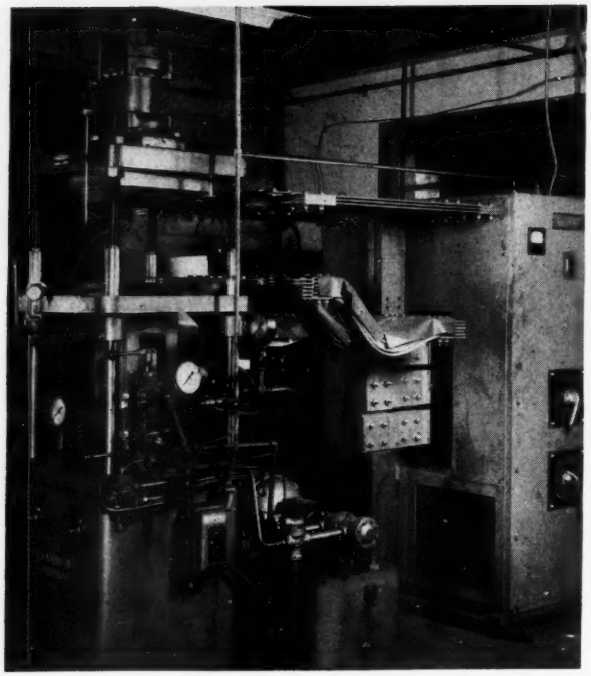
One example is the 9/16-inch drill which is reworked to ½-inch to meet other specifications; an old drill worn too short for its present job is sharpened and used again on another assignment. In one case the stubs of solid carbide turning tools were saved from scrappage by brazing a steel shank onto them, restoring the tool to its original length.

Effective control of the operation is accomplished by routing all tool purchase requisitions through the nonproductive material control department. By carefully screening purchase requisitions, the accompanying blueprints can be checked against tools in the obsolete stock bins. If an obsolete tool can be reworked to meet the blueprint specifications for not more than half the cost of the new tool, or if an obsolete tool used for another purpose will fit the new job, it is supplied to the requesting plant.

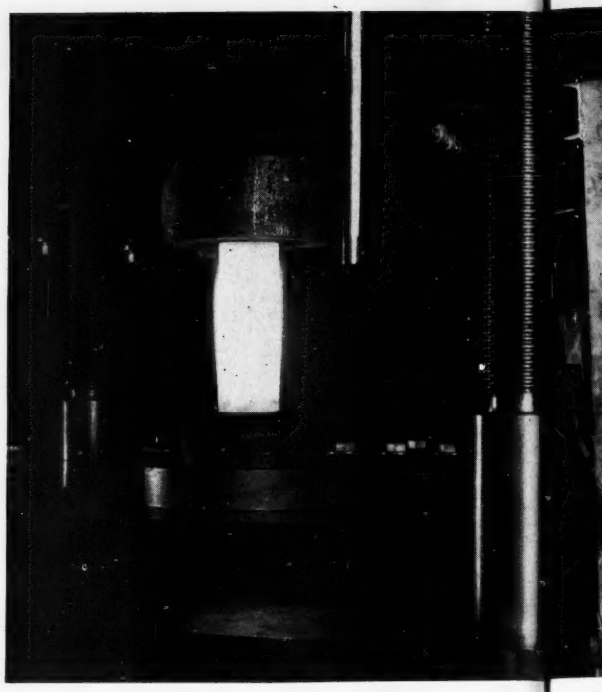
Thermal Shock: A New Study

Continuing development of process equipment that must be exposed at elevated temperatures is pushing demand for materials that will stand up under the required severe conditions. The type of materials needed is dictated by resistance to thermal fatigue and shock, denoting effects of temperature change or alternating exposure at extreme temperatures. These effects may be cyclic and occur at regular intervals or may be irregular—as in occasional shutdown of equipment ordinarily operated at elevated temperatures.

These factors are considered in a report, "Thermal Fatigue and Shock," by Helmut Thielsch, published by Welding Research Council. Among subjects covered are characteristics of thermal fatigue and shock in dissimilar and similar joints. Important procedures used to evaluate fatigue and shock are also described. Copies can be purchased for $1 from American Welding Society, 33 W. 39th St., New York 18.



Production resistance type hot press—pressure is applied to powder charge from both top and bottom to produce fairly long uniform bushings and flanged p'eces



Carbide bushing being hot pressed. At this instant temperature was 2600° F. Mold is uniformly white hot while graphite spacer blocks remain relatively cool

Ten-Cent Gear Not Here But . . .

Hot Pressing Applications Increase

Although no process exists for producing hot pressed metal powder mechanical parts rapidly on a commercial scale, the method is being successfully applied on costly materials

WHILE it's still too early to visualize the coming of a ten-cent hot pressed gear, it is believed continued development of the hot press technique in time will result in a fine array of products, complementing the excellent variety of parts continuously being developed by the normal cold pressing and sintering method.

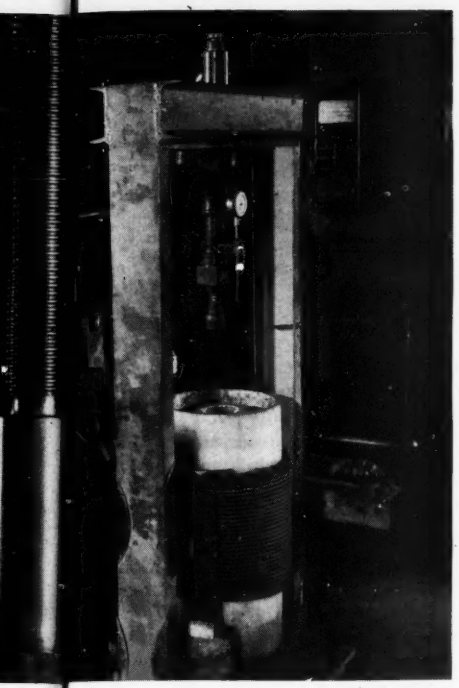
So far, Welded Carbide Tool Co.'s president Jerome F. Kuzmick says, no process has been worked out and placed into operation for producing rapidly hot pressed metal powder mechanical parts on a commercial scale. On the other hand, hot pressing is being successfully applied to a number of applications involving costly materials wherein the method is the only one which gives the desired results and cost is secondary.

Experiments Extended — Mr. Kuzmick says considerable experimental work is being done on extending applications of hot pressing. He pointed out to members of the Powdered Metal Association in Chicago that the method generally follows one of two procedures, hot forging or hot molding.

In the former, normally cold pressed and sintered parts are removed hot from the sintering furnace and subjected to a forging operation, usually in water-cooled steel dies.

In the latter procedure, pressing and sintering are performed simultaneously in one operation. The charge in the die may be the metal powder itself, or it may be a preform previously molded by the usual cold pressing method. The hot press method for the manufacture of large tungsten carbide sections has been in use for some time. But improvements in technique now have made it practical to apply the method to a number of sizes and shapes of tungsten carbide pieces.

According to Mr. Kuzmick, here is how it's done. Graphite molds are produced by machining graphite bar stock. In most cases the molds are the so-called "closing type"; that is, they are dimensioned so the proper size piece is produced when the plungers have compressed the carbide mixture so that the outer ends of the plungers are flush with the upper and lower



This high frequency induction hot press produces large diameter pieces. With most large sections, top pressure only produces satisfactory product

surfaces of the die barrel.

Low Pressure Used—From the known density of the end product, the weight of the desired carbide mixture is calculated and poured into the die cavity. The plungers are lightly pressed into the cavity and the mold positioned in the hot press. The piece is hot pressed at relatively low pressure on the order of 1000 psi.

The final temperature is similar to that used for sintering cold pressed carbide, usually about 2450 to 2650°F, depending upon the cobalt content. Care is exercised not to underpress or overpress. If the carbide mixture is not fully compressed, porosity will result in the finished carbide. Overpressing will squeeze out an excess of cobalt binder, causing improper binder content and local segregation of cobalt which again results in porosity or soft spots. Thus, even with closing type molds, the compression of the carbide charge is carefully measured with dial indicators.

One-Time "Shot"—Unfortunately, in most cases, it is impossible to salvage the graphite mold, so that it is used only once. However, there are many cases where this procedure is economically practical. On plain round cylinders and bushings, standard graphite round bar stock can be purchased in a number of sizes, so that often simple cutting-off and drilling operations only are required to produce the desired mold.

On small pieces it is possible to use multicavity molds in which several pieces are made simultaneously. For shaped pieces, it is often easier to machine a graphite mold than it is to machine presintered cold pressed carbide which is very fragile and must be handled and machined with extreme care.

No Shrinkage—One of the advantages of hot-pressed carbide is the absence of sinter shrinkage. It is well-known that cold pressed carbide may shrink as much as 18 per cent lineally or 50 per cent by volume during the sintering operation. Thus it is a difficult problem to avoid distortion on odd-shaped pieces or long thin-walled sections which may vary in density as cold pressed. On the other hand, the hot pressed carbide completely fills the mold cavity as it compresses and the dimensions are those of the mold cavity.

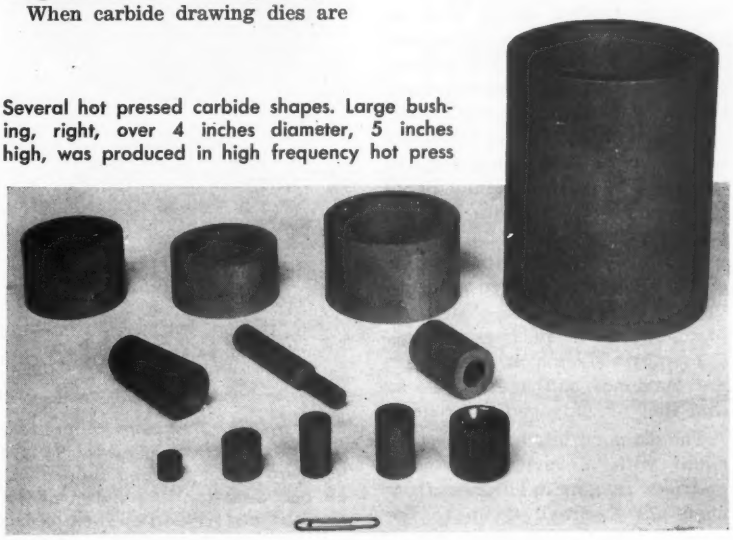
In these days of metal shortages, anything that can be done to conserve such strategic materials as tungsten and diamond powder is, of course, highly desirable. Welded Carbide Tool is making use of a technique that accomplishes this in some measure with respect to tungsten carbide drawing dies.

When carbide drawing dies are worn beyond bore tolerance, it was customary to grind out the inside diameter if possible, to the next larger size. This may not be too arduous on very small bore dies. But, as the size increases, the difficulty of this practice also increases, because the next larger size bore may require removal of a considerable amount of carbide. This requires considerable diamond wheel usage. The bore cannot be increased very much before the die wall becomes too thin and a sizable piece of tungsten carbide must be discarded.

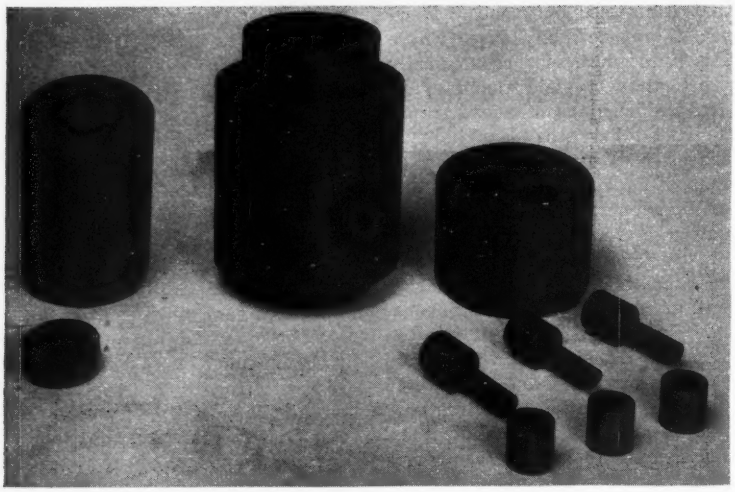
Salvage Goes Up—By hot pressing, however, it was possible to salvage thousands of drawing dies. In this method, the die is placed in a graphite mold with a core of the desired diameter, less several thousandths grinding allowance. The die is hot pressed in the mold and, as the carbide becomes plastic, it is compressed slightly, filling in the bore and losing a little in height.

As a result of this technique, carbide is taken out of the height, which is not critical, and transferred to fill in the bore, which is the critical dimension. The graphite molds can be used several times, and the surface of the carbide die retains a fairly good finish. Thus, only a few thousandths need be ground off the bore surface to produce a high degree of accuracy and finish.

Die Life Increases—One large concern which uses many dies for



Several hot pressed carbide shapes. Large bushing, right, over 4 inches diameter, 5 inches high, was produced in high frequency hot press



Several graphite mold assemblies: Right, parts of 3-cavity mold; left, shaped cavity mold powder filled; center, loaded bushing set for hot press

drawing tubing, Mr. Kuzmick says, has had the same dies repressed three times and they are in use today. The interesting part is that the die life after repressing has increased appreciably over that obtained on the original cold pressed and sintered die. It is believed this is due to the elimination of microporosity by the hot repressing operation.

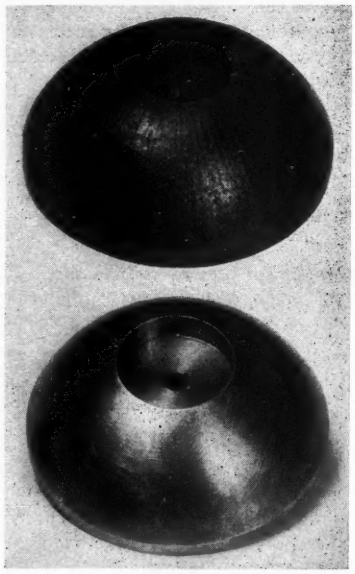
Some interesting applications of the hot press technique are being made in the diamond dressing, grinding and drilling fields. A good example is diamond mining bits, for exploratory, blast hole, and oil well drilling.

Many such bits were formerly—and in some cases still are—produced by casting alloys such as beryllium-copper around diamonds. When drilling tough and broken geologic formations, however, such bits may show rapid metal wear and erosion causing the diamonds to be lost before they are worn to the extent of their useful life. Some bits also are made with a cold-pressed and sintered metal matrix. For most applications, however, manufacturers have been going to the hot press method. They are producing metal matrices that resist wear and erosion, and retain the diamonds sufficiently well so that they are salvaged and reused.

The diamond bits are being produced with a variety of metal matrices, ranging in hardness from about 29 Rockwell C up to the full hardness of tungsten carbide. Particular matrix used depends upon service to which the bit will be subjected.

Now Heavy Metals—A recent development, Mr. Kuzmick says, is the use of the hot press process for producing heavy metals. It is believed this is the first time hot pressing has been employed for this purpose.

These heavy alloys have been produced for more than a decade by the cold press-sinter process. They consist of about 90 per cent tungsten and 10 per cent of a nickel-copper binder. Their theoretical density ranges from 16.5 to 17.2 for the usual percentages of binder employed.



Only a few thousandths of precious tungsten alloy was removed to give this gyro wheel required surface finish and accuracy. It's shown as hot pressed, and after finish machining

Difficulties involved in producing cold pressed sintered heavy alloys are similar to those encountered in sintered tungsten carbide.

Distortion Problem—If you want close to theoretical density, great care must be exercised in controlling particle size and purity of powders, sintering temperature, etc. During the sintering of cold-pressed pieces, shrinkage as high as 20 per cent lineally may take place. This makes it difficult to control dimensions, particularly on large sections to prevent distortion. For such objects as tall bushings, it is impossible to eliminate the "hour-glass" shape due to differences in density prior to the sintering process.

In developing the hot press method for producing high density materials, the usual graphite molds were used. One of the first problems encountered was carburizing of the tungsten by the mold. A coating was developed which, when painted or sprayed on the mold, not only prevented this carburizing tendency, but also protected the mold itself. Thus, a number of pressings were made from one mold.

Structure Better—With the hot press method, it is relatively easy to achieve full density. Parts have been produced to densities ranging from 16.5 to 17.1 depending upon the particular composition.

There is no problem of distortion, as the metal under heat and pressure completely fills the mold. Structure of the hot pressed heavy alloy is much finer in crystal size than that of its cold pressed-sintered counterpart.

Reason is the hot press cycle is relatively fast, whereas sintering to high density requires sufficient time to cause considerable growth in the crystal size of the tungsten. Machinability of the hot pressed alloy is considerably better than that of the sintered material. This is believed due to the difference in crystal structure.

An accompanying illustration

NEW LINCOLN PLANT CREATED BY INCENTIVE-INSPIRED CO-ACTION IN DEVELOPING POSSIBILITIES IN PRODUCT

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HOW TO ESTIMATE SAVINGS WITH STEEL

THE table (Fig. 3) provides a rule-of-thumb comparison on which to estimate savings with welded steel. The figures shown are based on shop costs of $2.00 per hour and 200% overhead. Welded steel designs that do not already average 50% savings can be analyzed similarly to detect excessive fabricating expense.

CASTING		WELDMENT			Fig. 3
AVERAGE DESIGN		EQUIVALENT MATERIAL DESIGN		50% EXCESS MATERIAL DESIGN*	
Weight (lbs.)	Cost ($)	50% Cost Reduction	25% Cost Reduction	50% Cost Reduction	25% Cost Reduction
		Allowed Labor Time (hours)		Allowed Labor Time (hours)	
10	1.60	.11	.17	.09	.16
20	3.20	.22	.35	.18	.32
40	6.40	.43	.70	.36	.63
60	9.60	.65	1.05	.55	.98
80	12.80	.70	1.40	.73	1.27
100	16.00	1.17	1.75	.92	1.59
200	32.00	2.27	3.50	1.83	3.17
300	48.00	3.25	5.25	2.75	4.75
500	80.00	5.42	8.75	4.60	7.90
700	112.00	7.60	12.25	6.40	11.10
1000	160.00	10.85	17.50	9.15	15.80
1500	240.00	16.25	25.40	13.75	23.80
2000	320.00	21.70	35.00	18.35	31.70
2500	400.00	27.10	43.70	22.90	39.50
3000	480.00	32.50	52.50	27.50	47.50

* Products with design sections having 50% more steel than equivalent needed to carry loads.

HOW TO DESIGN IN WELDED STEEL—Complete training course for designers and production engineers now available for presentation in your plant. Send for complete details.

Fig. 2—"Equivalent Sections in Steel" using good shaping practices are:

TYPE OF LOAD	DESIGN NEED	AMOUNT OF STEEL AREA NEEDED TO REPLACE IRON SECTION
Tension	Rigidity	40%
	Strength	25%
Compression Short Column	Rigidity	40%
	Strength	90%
Compression Long Column	Rigidity	35%
	Strength	35%
Bending	Rigidity	35%
	Strength	20%
Torsion	Rigidity	35%
	Strength	25%

PROPER DESIGN IN STEEL IMPROVES PRODUCT CUTS COST 50%

SINCE steel is credited with being 2½ times more rigid and 4 times stronger than run-of-foundry gray iron, material costs can be cut as much as 95% on many products when converting to welded steel.

Replacing cast iron with steel on a pound-for-pound basis, without changing product shape, cuts material costs 63%. Then, by using the right amount of steel and still without changing product shape, 60% to 75% of the metal can be eliminated and material costs reduced to 15%. Ultimately utilizing a more efficient product shape, possible only with steel, reduces material cost to as low as 5%.

Most production savings are achieved on product conversions where simply the correct amount of steel or "equivalent section in steel" is incorporated into the design (Fig. 2). The chart (Fig. 3) shows how much fabricating is possible on such conversions to maintain overall production savings averaging 50%.

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shows a rotor wheel for a gyroscope as hot pressed and finish machined. You will notice most of the wheel surface consists of a convex contour, which must follow a definite radius. It would be difficult to produce such an accurate contour from cold-pressed and sintered material, because of distortion.

Little Metal Removal—On the hot pressed material, it was only necessary to remove a few thousandths of the precious tungsten alloy to give the required surface finish and accuracy. In regard to the latter, the wheel must be finished to tolerances of 0.0001-inch.

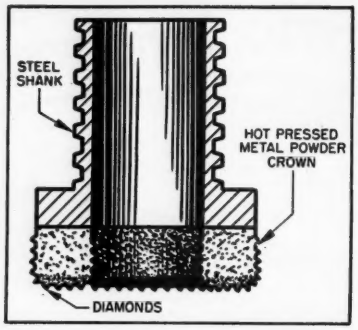
Where tolerances on the order of 0.005-inch are satisfactory and surface finish is not too critical, the hot pressed piece can be used without finish machining. This wheel withstood speed tests of 30,000 rpm and was found to be excellent for balance.

Other sections produced by hot-pressing formerly required machining away as much as 50 per cent of the tungsten alloy from the sintered piece to produce the required contour. It is anticipated that expansion of the hot pressed heavy metal applications will result in considerable savings in tungsten scrap and machining time.

Other Applications — Variations of the hot press technique are applied to other products. Seybolt, Frandsen and Linsmayer in STEEL reported using a frequency induction hot press, a graphite die with a chromium plated steel or an Inconel liner and low-carbon steel punches. They produced a hot pressing of more than 30 pounds in a 12-inch diameter die. The properties compared favorably with vacuum cast extruded material.

A form of hot-pressing, or sintering under pressure, is used in producing metallic friction materials. The friction surface or wafer is welded to a steel back and brought to final density by being sintered in a special bell type furnace, which applies pressure to a stack of the friction wafers and steel plates. Also large silver base contact materials have for a number of years been produced by hot pressing.

New Developments — Mr. Kuzmick says that one of the virgin fields of research is that involving high temperature alloy or metal-ceramic materials. It is known that considerable time, money and energy are going into powder metallurgy research involving high temperature materials. In one research program with which Mr. Kuzmick was associated, objective was to see whether an alloy prepared by hot pressing powders would have properties similar to that of the same alloy prepared by forging.



Crown of this 2-section diamond coring bit is molded and bonded to steel shank simultaneously in one operation

After considerable work, a method was developed whereby a hot pressed alloy was prepared which showed the same high temperature stress-rupture value as the forging. Subsequently, advantage of the powder metal process was taken, whereby certain materials and grain orientation were introduced which are impossible to obtain in material which begins as a cast ingot.

In a surprisingly short time this technique resulted in a modified alloy which showed over five times the stress-rupture life at higher temperatures than that of the forged material.

New Alloys Appear—Since then, a number of alloys and materials have been developed by the hot-press method. Many show unusual mechanical properties. Steels for more ordinary uses, both carbon and alloy, have been produced experimentally.

In time, it is believed these steels will be used for producing dies for molding, drawing, etc., with considerable savings in machining and finishing.

Of course, the problem of a suitable die material always rears its head, Mr. Kuzmick says. Just about every type of ceramic material available has been tried as well as high-temperature alloys and cermets.

"We have not yet run across a permanent hot-press die material," he says. "However, we have tried another approach which shows considerable promise. In this method we mold a cheap, discardable die, and don't worry about whether it will last for more than one pressing but simply whether it will produce one good pressing. In mass production the cost of such a die should be measurable in cents rather than dollars."

Flow Answers in Minutes

Pipeline - network analyzer is solving problems of flow and pressure loss for Midwest Research Institute. The seven-foot electronic and mechanical unit proves a time-saver by cutting down time taken for calculations when several alternate plans are considered for building, extending or reinforcing a network.

The institute says that the analyzer grinds out answers in about 30 minutes that took many days to achieve by the trial and error method.

Typical of its varied applications are those in determining favorable pipeline locations; selecting pipe diameters; predicting effects of a choice of elevation for reservoirs or storage tanks; and evaluating pressure variations.

The unit employs a system of electrical analogies for physical factors involved in networks that carry water, oil and natural gas. The same principle is used for steam heating networks and air conditioning systems. An electrical control board duplicates an actual supply network, which can comprise as many as 99 different supply lines. Operator can also control such factors as source, rate of flow, pressure and other related elements.

Amount of light reflected by special tubes, called fluisters, indicates which section of the network is under the heaviest load. Meter readings register other comparative values.

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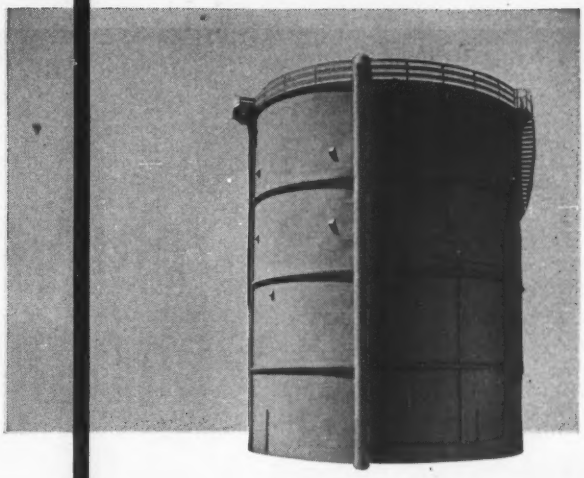

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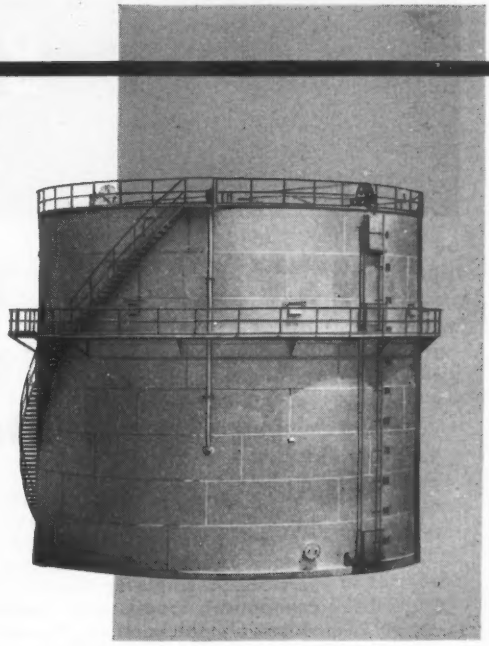

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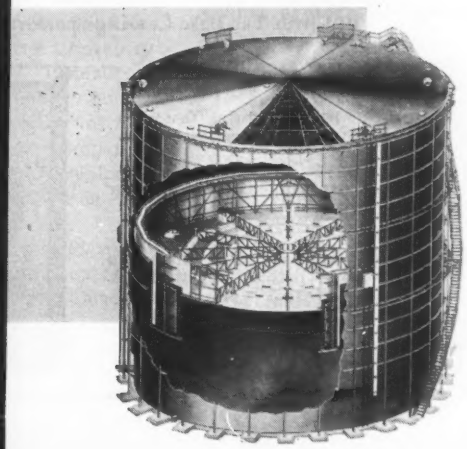

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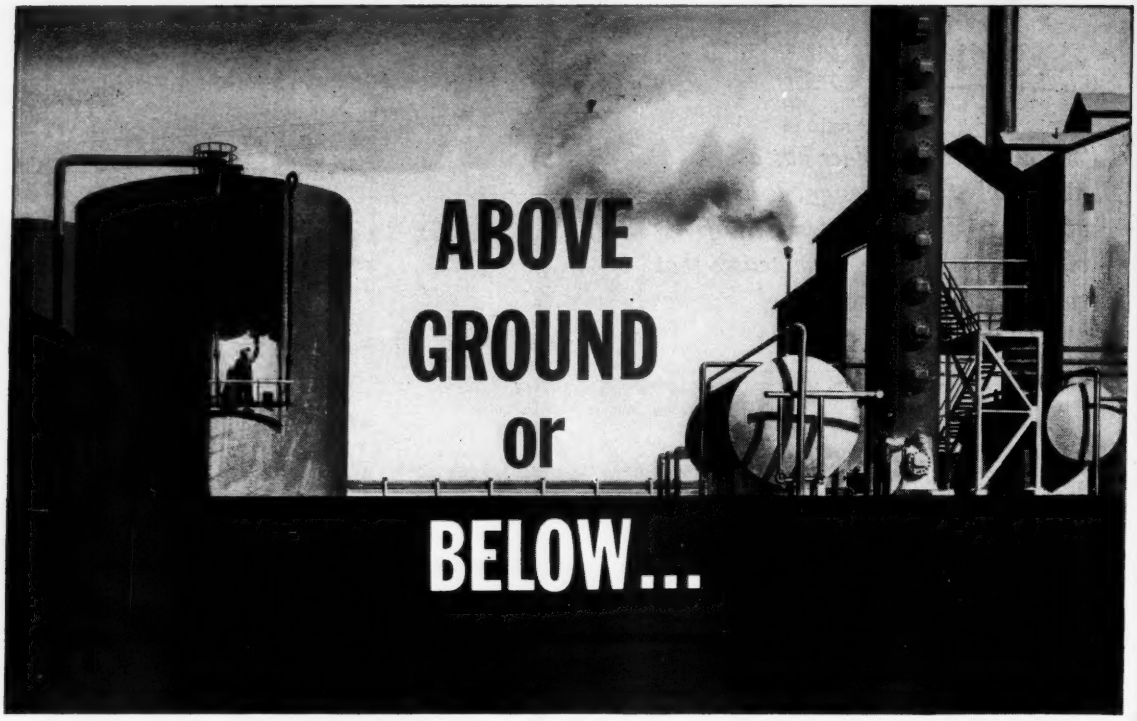

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Servicing Shortened

Railroad success with spectrography indicates expanded application in maintenance

RAILROADS participating in spectrographic analysis report sizable maintenance and repair savings as a result of improved techniques and more accurate interpretation. While analysis is not yet designed to replace inspection and maintenance programs, results show it proves valuable as a supplement to present practices.

Technique improvements in the past year have prompted more extensive application and reliance in several phases. One of these has maintenance men exploring possible extension of overhaul periods through use of spectrographic analysis. The method is already effective in reducing out-of-service periods formerly required to determine extent of engine wear by visual inspection.

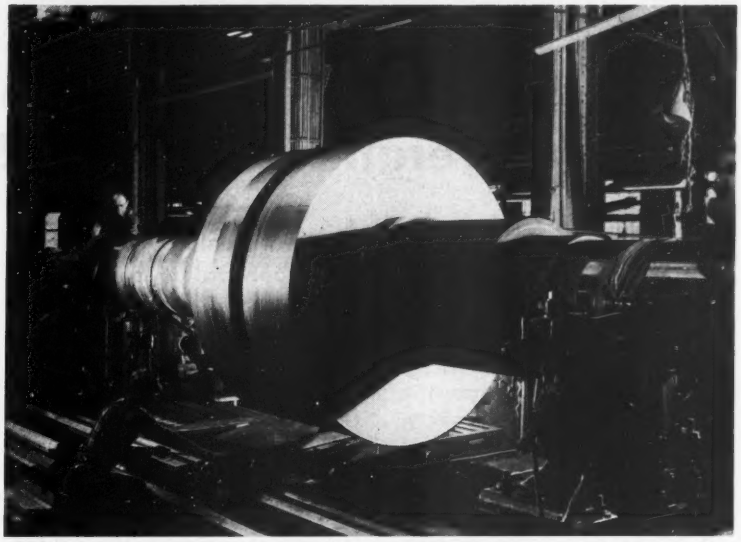
Shortcut to Detection — These were some of the reports heard when American Locomotive Co. sponsored a two-day symposium for railroad representatives at Schenectady, N. Y. Subject was use of the spectrograph in analyzing diesel engine lubrication oil to detect and prevent serious engine trouble. About 50 U. S. and Canadian roads were represented. H. R. Sennstrom, Alco research and testing engineer, acted as chairman.

In railroad applications, the spectrograph makes a photographic record of the various metallic elements found in diesel lubricating oil and removed periodically from diesel engine crankcases. Analysis of the spectrum photograph results in a quantitative indication of metallic elements present. When these quantities are interpreted, they reveal the specific condition of many engine components, such as pistons, rings, cylinder liners and bearings.

Six Indicator Elements — If analysis shows an increase in quantity by any of six indicator elements, the engine should be subjected to whatever maintenance will correct the condition. These elements are silica (dirt); aluminum (pistons); chromium (chrome-plated liners and water leaks); iron (rings and several other parts); copper (bearings); and lead (bearings).

A resolution proposed by W. R. Seniff, testing engineer, Baltimore & Ohio Railroad, indicates work will continue toward increasing acceptance of the method.

Mr. Seniff proposed that a committee from railroads and manufacturers determine standard laboratory techniques and tolerances for formal submission to American Standards Association.



Finishing Touch for a 78-Ton Spindle Forging

Low pressure spindle forging for a 120,000-kw cross compound reheat steam turbine is rough machined on a lathe at Allis Chalmers' W. Allis works. The 78½-ton forging is 26 feet—5 inches long and has an 85½-inch maximum diameter at the center section—said to be one of the largest in weight and diameter ever made for a steam turbine. Original ingot weight was 185 tons

Reliability in Rupture Test

Increased reliability in creep rupture tests is the claim made for a 12,000-pound capacity machine developed by the research laboratory at Heppenstall Co., Pittsburgh. Tester was designed by Dr. Robert Corbett, acting director of research, for gaging the company's high alloy steels in high temperature applications. Builder is Arcweld Mfg. Co., Pittsburgh.

One feature that should make the job easier is a power-operated lifting mechanism for loading specimen weights. During testing, the loading platform positions automatically about ½-inch below the weight pan. This minimizes the shock of dropping weights when the specimen breaks.

Base is designed to make floor bolts unnecessary. It gains further stability through leveling screws and a new-type shock absorber and vibration isolator.

Furnace with three heating zones provides for testing at temperatures up to 1800°F. This hastens attainment of uniform temperatures over the specimens' gage length; temperatures in the three zones can be regulated individually from the control panel. To simplify vertical adjustment, the furnace is counterbalanced and a position-indicating scale provided. A locking arrangement prevents shifting during test.

Furnace windings may be removed for inspection or repair. They are attached to an Alundum tube within a larger tube.

Elongation can be observed on a dial gage mounted on the upper extension grip. The company reports it is developing an indicating system based on the lineal differential transformer. By its use, elongation of several specimens in different machines can be recorded automatically by a central recorder located apart from the operation.

Cost Outweighed By High Steel Output

Technical papers presented at general meeting of American Iron and Steel Institute include appraisal of refractories coke and coke oven gas, manganese and tin plate

OVER half the refractories used in the steel plant are consumed in the open-hearth shop and the service conditions are so severe that only a short time usually is required to show inferior quality. This appraisal was brought out by E. B. Snyder, refractories engineer, Wheeling Steel Corp., Steubenville, O., at the 60th general meeting of the American Iron and Steel Institute, Waldorf - Astoria, New York, May 21-22.

In his paper, "Refractories for the Basic Open-Hearth Furnace and Auxiliary Equipment," he said refractories are relatively cheap and should be effectively used rather than saved because increased production soon will pay for total increased consumption. Increased furnace availability, higher operating temperatures and higher rates of production generally have more than compensated for increased refractory cost.

Concrete for Arches—The only recent development in refractories for flues is the use of high temperature concrete for arches and in some cases for the entire flue system. The factor in the success of concrete flues is the care used in preparing the concrete mix. Proper proportioning of the high-temperature cement, the coarse and fine grog material, is important. The material should be mixed adjacent to the job to prevent segregation. Substantial labor savings can be realized with this type of construction.

Although high-duty clay brick are universally used for open-hearth checkers, the use of oxygen, all-basic furnaces, and higher operating rates may lead to the need for better checker brick. The present preference for checker brick is a low porosity, high-density product. Some checkers have been topped with silica and superduty clay brick.

Suspended Arches Work—Elimination of the double checker chamber for air and gas has allowed simplification of the fantail arch construction. Many shops have installed flat suspended arches with exceptionally good success. The quality of brick used may be high-duty, superduty clay, semisilica or silica. Some installations have been made with plastic fire brick. Basic brick are usually used in the fantail nose in basic end furnace.

The steel-encased, burned and unburned magnesite-chrome, and chrome-magnesite compositions all have given good life in furnace endwalls. Some shops prefer the basic end because of lower cost per ton and increased availability. Approximately 74 basic end furnaces are in operation today. With silica roofs, a good grade of silica mortar is important. Rapid roof joint wear results from the use of low refractory silica cements.

Costs Still High—The all-basic roof is a development that has possibilities of revolutionizing open-hearth operation. Trials indicate that the production rates, although extremely high, cannot justify the initial cost unless profits on the excess tonnage are credited.

With less than full operation the extra cost cannot be absorbed. However, improvements in the spalling resistance of basic brick will make the all-basic furnace economically feasible.

The unfired, metal-encased magnesite-chrome brick give the best life for frontwalls if they are properly supported with steel plates braced to the buckstays. Extremely short frontwall life many times can be traced to insufficient foundation at the start of the campaign or underpinning because of poor frontwall maintenance practices.

Rammed Bottoms Popular—Although many types of basic brick and ramming materials have been used, rammed bottoms on magnesite brick subhearths appear to be the most popular at the present time. A further modification is the rammed chrome subhearth with basic brick on top, finished with rammed main hearth.

The advantage of the rammed hearth over the old burned-in grain magnesite hearth is the short time required for the installation.

Some records show less bottom maintenance on burned-in hearths. However, the difference is not great enough to justify the extra time required to burn-in a deep hearth. Rammed hearths with high magnesia contents, over 90 per cent, are also being tried at the present time.

For most shops, the silica brick lined door is the most economical from the standpoint of initial door cost, material cost and heat loss from the furnace. The life of a silica brick lined door will be from one-third to one half the life of a rammed door.

Better Refractory Needed — A better refractory is needed for rammed or cast doors. If it were not for heavy water cooling by studs, the present rammed doors would not last as long as silica brick. An improved refractory with better insulating powers is needed for door linings.

The most economical mixer lining today is a combination lining with high-duty clay brick in the area of least wear, such as roof, tank lining, and extreme bottom, with a combination of hard burned superduty clay brick and sillimanite (mullite) placed in the areas of extreme wear in such a way as to

"We cut fuel costs in half!"

CONTROL DATA		
LINING	**MAX. FUEL CONSUMPTION**	**CONTROL**
Ordinary Firebrick	**1,000,000 BTU/HR**	**100 to 150F Overshoot of Critical Pouring Temp.**
B&W Insulating Firebrick	**500,000 BTU/HR**	**No Overshoot of Critical Pouring Temp.**

THE CHART ABOVE shows how B&W Insulating Firebrick slashed fuel bills by 50% and provided close temperature control when it was used in place of ordinary firebrick in a crucible type furnace melting magnesium. Similar savings were also made on identical units melting aluminum. • The reason for this superior performance is that lightweight B&W Insulating Firebrick store and conduct less heat, thus provide faster heating up time and lower fuel consumption. These brick also respond rapidly to changes in heat input, assuring excellent temperature control.

The defense plant expansion program has created unprecedented demands for B&W Insulating Firebrick. It is, therefore, necessary to anticipate your requirements as far in advance as possible.

KAOCAST FLOOR TAKES PUNISHMENT

In this same furnace, a floor of B&W Kaocast, the 3000 degree refractory castable, withstood the spillage of crucibles . . . eliminated the need to renew the floor every time a crucible was replaced.

BABCOCK & WILCOX

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R-384

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What's YOUR steel ring problem?

With forty years' experience in manufacturing circular rolled and welded steel parts for industry, Cleve-Weld engineers specialize in solving ring problems. If your contracts call for parts utilizing stainless steel or other types of rings or bands, call on Cleve-Weld. We have the equipment, the skilled man-power and engineering to assure quick delivery with economy and accuracy of production. Write for Cleve-Weld's General Catalogue today.

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Specialists in RINGS · BANDS · WELDMENTS

equalize the overall lining wear.

Manganese Experiments — S. Marshall, research associate, research and development laboratory, United States Steel Co., Pittsburgh, said experimental work done within the last two years with the AISI assistance and sponsorship has demonstrated that at least three processes for the recovery of manganese from open-hearth slags are technically feasible.

Each, he asserted, will be scaled up to a sufficient degree to determine its practicability and economic value in the event of an emergency.

In a survey in which AISI polled the steelmaking capacity of this country it was disclosed that an estimate of 772,000 net tons of metallic manganese is contained annually in open-hearth slags, a large portion of which goes to slag dumps. This is more manganese than the steel industry purchases for consumption in a year. This tonnage originates from the smelting of current iron ores in blast furnaces.

Mr. Marshall described three processes now being investigated in Pittsburgh, College Park, Md., and Chicago.

Coke Evaluating Tests—R. W. Campbell, staff specialist, coke and by-products, Jones & Laughlin Steel Corp., Pittsburgh, pointed out that in considering the tests themselves, the shatter test prescribes four separate breakage events and the standard tumbler test 2800 since there are two lifts and 1400 revolutions, i.e., 200 breakage events of only several inches, correlated so highly with the results after four 6-foot shatter drops indicate that the breakage of coke follows a definite pattern which is capable of exact definition and should result in an index of precise significance for the evaluation of coke.

Correlation coefficients show principally, that the permeability of the coke and the size of the coke are strongly related. Due to the high correlation of screen and shatter tests, the high correlations with the shatter indices are to be expected but in themselves have no separate significance.

On the other hand, the lack of

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LININGS FOR TANK CARS AND TRAILER TANKS

RESISTANCE—Heresite linings effectively prevent product contamination of such items as Sulphuric Acid, Rubber Latex, Formaldehyde, Battery Acid, Lactic Acid, Acetic Acid, Fruit Juices and Wine. These products can be delivered fresh and full strength, unchanged.

EASE OF CLEANING— Heresite lined tank cars are quickly cleaned by Steaming, Hot Water, or any type of Solvent Wash.

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SYNTHETIC RUBBER LINING
The strongest caustic hydroxide solutions, as well as the halogen acids and other chemicals, may be transported in a HERECROL lined tank car or trailer tank. Our literature will interest you. Write for it today.

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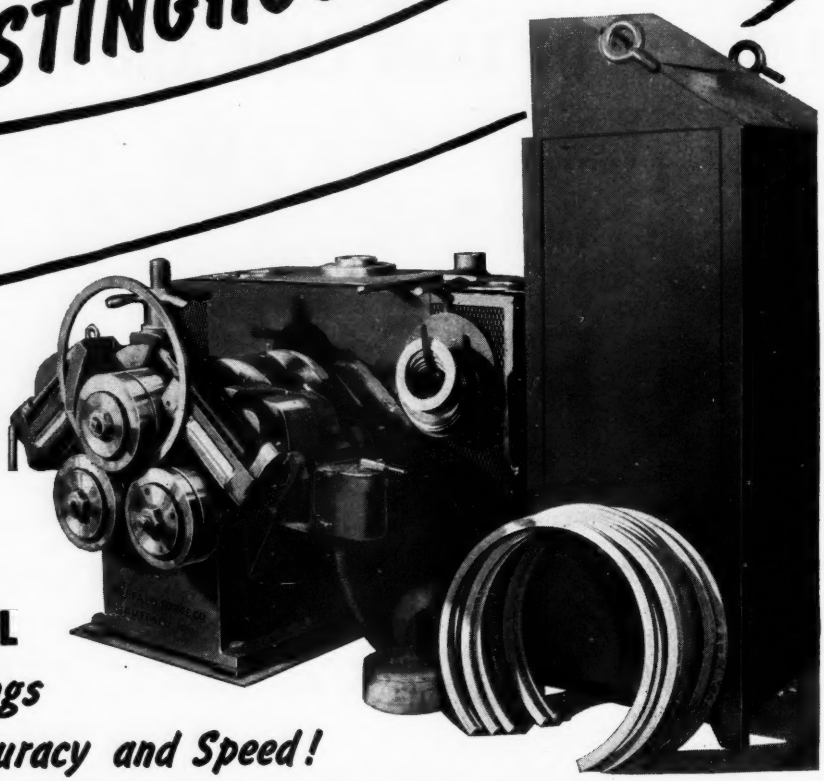
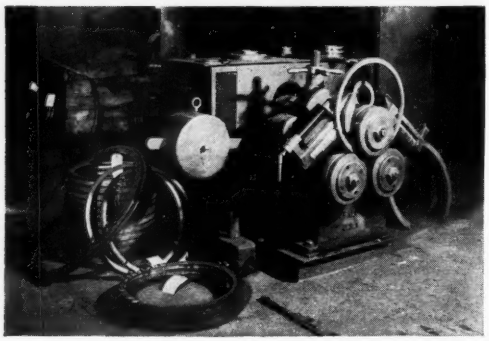
MANITOWOC, WISCONSIN

Rolling Up Production at WESTINGHOUSE!



THIS "Buffalo" BENDING ROLL *Produces Rings with Accuracy and Speed!*

• Above, the "Buffalo" No. 1 Bending Roll at the Buffalo Division of Westinghouse Electric Corporation, bends a 1" x ½" flat on edge to make an accurately formed ring for a Westinghouse motor. In plants by the hundreds, "Buffalo" Bending Rolls are recognized as the quickest, easiest and most economical way of producing arcs, circles and spirals from: (1) Angles, leg-in; (2) angles, leg-out; (3) beams; (4) channels; (5) flats; (6) rounds; (7) squares; (8) tubing and pipe. For facts on "Buffalo" Aircraft Type Benders, write for Bulletin 3344-B. For the heavier horizontal and vertical benders, write for Bulletin 352-C.



ALL IN A MORNING'S WORK

is this group of rings at the Westinghouse plant. *Note how close the ends are brought together for the welder. This is a vertical model "Buffalo" Bending Roll.*

"Buffalo" MACHINE TOOLS

BUFFALO FORGE COMPANY

158 MORTIMER STREET BUFFALO, NEW YORK

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

DRILLING PUNCHING SHEARING CUTTING BENDING

correlation between the permeability and the hardness indices is to be expected, even though the resistance to attrition may be a contributing factor as the coke descends the shaft of the blast furnace.

Since the tabulated indices of coke size or strength increases numerically with increasing values and the permeability indices decrease numerically with increasing permeability, the negative coefficients indicate that the larger or stronger cokes are more permeable.

It is recommended that the moisture be determined on a 1000-pound sample of plus 1-inch coke in the permeability cylinder. Generally this will permit the sample to be dried in about one hour's time. The influence of this factor is directly assignable, that is, the coke as a fuel suffers in direct proportion to the moisture content.

Result of Reactivity—The reactivity of a coke increases with an increase in volatile matter content of the coke and the coke becomes softer as the volatile matter increases.

The 2-inch screen index is recommended because this index reflects the native fissuring of the coke and is a composite of the coals used, carbonizing temperature, coal pulverization, coal bulk density and ash content.

The tumbler hardness index, the +¼-inch coke at 400 revolutions is recommended because it shows low correlation with breakage characteristics, which suggests that it may be measuring some other factor, such as attrition. The original intent of the tumbler was a measure of attrition, but the test data clearly reveal that the commonly used stability index (plus 1-inch coke) at 1400 revolutions measured the same factor as the screen index and the shatter index.

Current standard methods for measuring bulk density are inaccurate and low due to the small quantity of coke used and the shape of the container. To measure this factor the permeability cylinder is recommended because it has a cubic content of 28 cubic feet, or 3½ times larger than the present container. Bulk density is

Vapor FROM Paper STOPS RUST

PACKAGING COSTS CUT FROM $4.95 TO $1.37

Back when messy oil and grease coatings were used to ward off corrosion of diesel locomotive parts, the maker had headaches at both ends of the line.

Packaging steps called for inflammable liquids, heavy handling equipment, air hoses, and varnish-like petroleum solutions. In those days, waxed paper and heavy wooden crates were "musts." At the railroad end, unpacking meant the same troubles in reverse; laborious "cleaning" was a costly chore.

Now, says the diesel firm, "packaging is a dream."

Large and small parts are protected only by a paper that gives off vapor. *It stops rust.* It is Angier VPI* Wrap.

A cylinder liner (see above) is simply put in a container with pieces of the paper. The lid on, VPI goes to work. Now cost of packaging is $1.37 — not $4.95. The liner is ready-to- use when received. No "cleaning" to do.

If you store or ship metal parts or products, get "VPI Facts" from Angier — the most experienced name in vapor rust preventives.

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Send "VPI Facts" as applied to:

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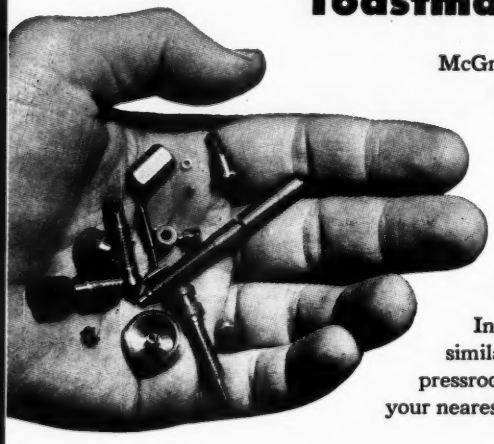
☐ Electrical Machinery, Appliances, Products.
☐ Transportion Equipment — Auto, Aircraft, Naval, Railroad, etc.
☐ Fabricated Products — Cutlery, Hardware, etc.
☐ Steel in process of fabrication.
☐ Ordnance Equipment.
☐ Instruments and clocks.
☐ Other.

Sign below; attach to your letterhead

* ® Vapor Rust Preventive

THIO
TRADE MARK
Cutting Oil

Toastmaster has the situation in hand



McGraw Electric Company's Toastmaster Products Division at Elgin, Illinois, settled the cutting oil question ten years ago with THIO Cutting Oil. This coolant is now widely used in the production of ferrous and non-ferrous parts in Toastmaster's automatic screw machine departments.

Satisfactory tool life has been one advantage of using THIO Cutting Oil. The quality of the finish has been of particular importance, however, since special finishing operations have been eliminated. All parts, from a .020 inch washer to a 25½ inch bar, are ready for assembly as they come from the automatics.

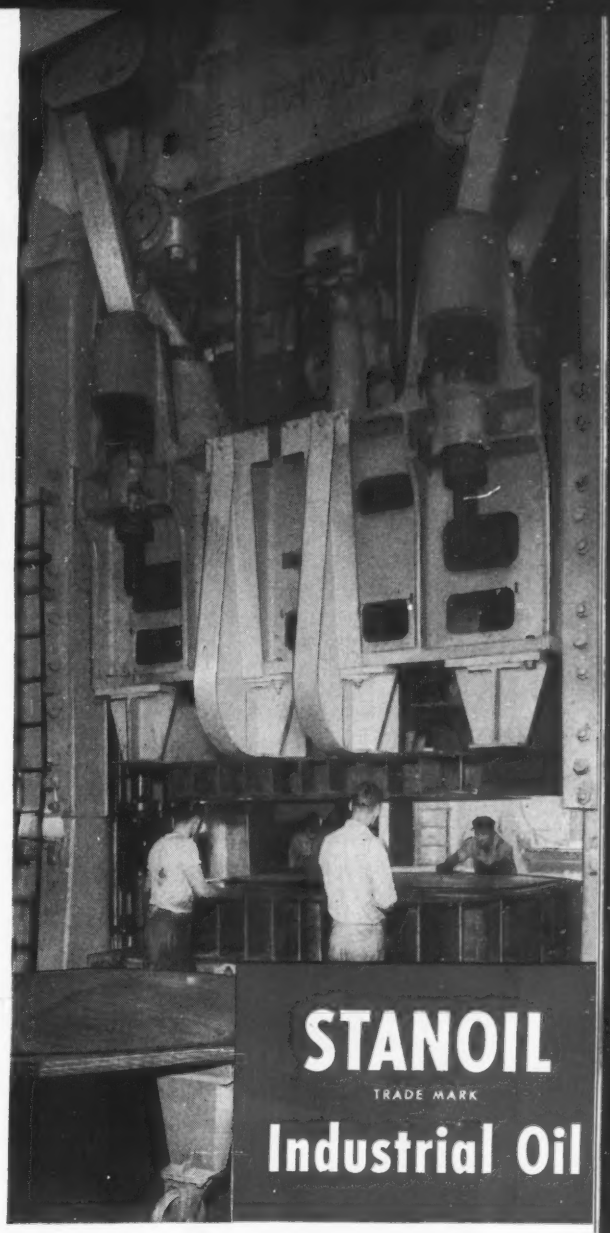
In short, Toastmaster has the coolant situation well in hand. To develop a similar case in your own screw machine or grinding departments, or in your pressroom, call for the services of a Standard Oil lubrication specialist. Contact your nearest Standard Oil Company (Indiana) office.

What's YOUR problem?

William Voegeli, of Standard Oil's Joliet office, has worked closely with McGraw Electric Company for several years—helping to maintain the high standard of quality that THIO Cutting Oil is making possible on automatic screw machine work.

Like all Standard Oil lubrication specialists, he has a broad background of practical experience plus thorough training in Standard's own schools. And like all lubrication specialists, his on-the-job assistance is always available to the industries in the immediate area he serves. He is one of a corps of experienced men who make their headquarters wherever industry is located throughout the Midwest.

For help with *your* problem, call for the services of your Standard Oil lubrication specialist today!

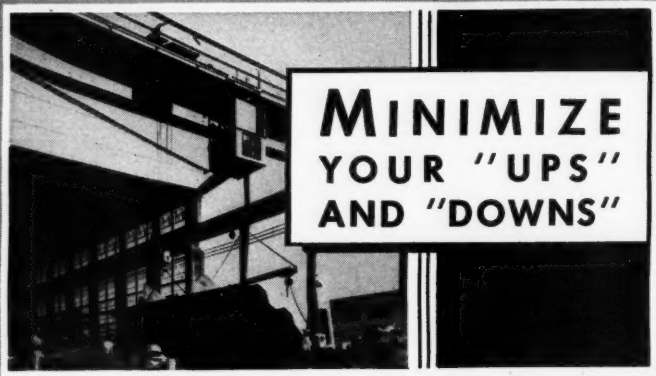


If your problem concerns hydraulics, consider the case of this heavy-duty toggle press. Here, the use of STANOIL Industrial Oil has resulted in over three years of trouble-free service to date, with no need to shut down for inspection of the hydraulic system. Samples show the hydraulic oil to be in excellent condition.

In a wide range of metalworking equipment—in speed reducers, air compressors, machine tools, electric motors, oil bath and bearing systems, as well as in hydraulic systems —STANOIL offers greater oxidation stability, greater protection against rust, and satisfactory performance at all temperatures. Ask your Standard Oil lubrication specialist about STANOIL Industrial Oil today. Contact your nearest Standard Oil office, or write: Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD

STANDARD OIL COMPANY
(INDIANA)



MINIMIZE YOUR "UPS" AND "DOWNS"

Those moves of material "up" — "down" — "in" — "out" — "across" and "back" can't be avoided — but their cost can be minimized.

It's largely a matter of proper selection of cranes, hoists, etc., as to type, construction, cost of operation, freedom from repairs, etc.

We've built these types of equipment for several decades but we are regarded by our customers as material handling "consultants." We'll welcome an opportunity to discuss your problems. Doubtless there's a Euclid crane or hoist to handle the situation in an ideal manner.

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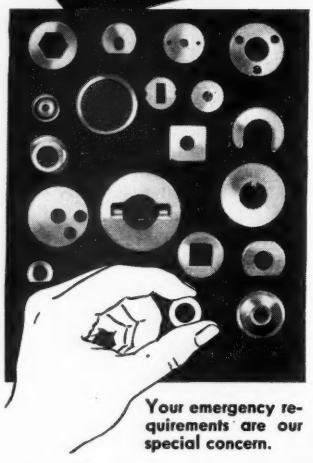

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Your requirements for standard and special steel washers are sure to be satisfied at Joliet. A bank containing thousands of special dies in many shapes and forms, 9/32" to 8" O.D., gauges No. 28 to 3/8", stands ready to answer your needs. A VARIETY OF FINISHES IS AVAILABLE to meet your special needs, including: Electro-plating, Galvanizing, Parkerizing, and Cyanide hardening.

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affected both by coke size and size consist and apparent specific gravity.

Use of Coke Oven Gas—In developing the use of coke oven gas in the open-hearth at the Sparrows Point plant of Bethlehem Steel Co., J. H. Kelley, assistant superintendent, open-hearth and bessemer department, said that in the early experiments with tar and gas, it was found that even with 70 per cent coke gas, checkers on the cool side (visual) clogged as quickly as when straight tar is used. It was also observed that when the first pass checkers appeared hot, the tar-gas deposits were dense, but did not melt. This condition gave good heat time over an extended campaign. These observations had to be checked as to the relation of fuel, temperature, and checker deposits to give the best zone of operation.

In going from lower to higher temperatures the difference in operation was from clogging checkers with porous deposits, good operation with dense deposits, and checker damage with melting deposits. This study showed tar-gas firing gave deposits which went through these transitions at about 100°F higher than oil.

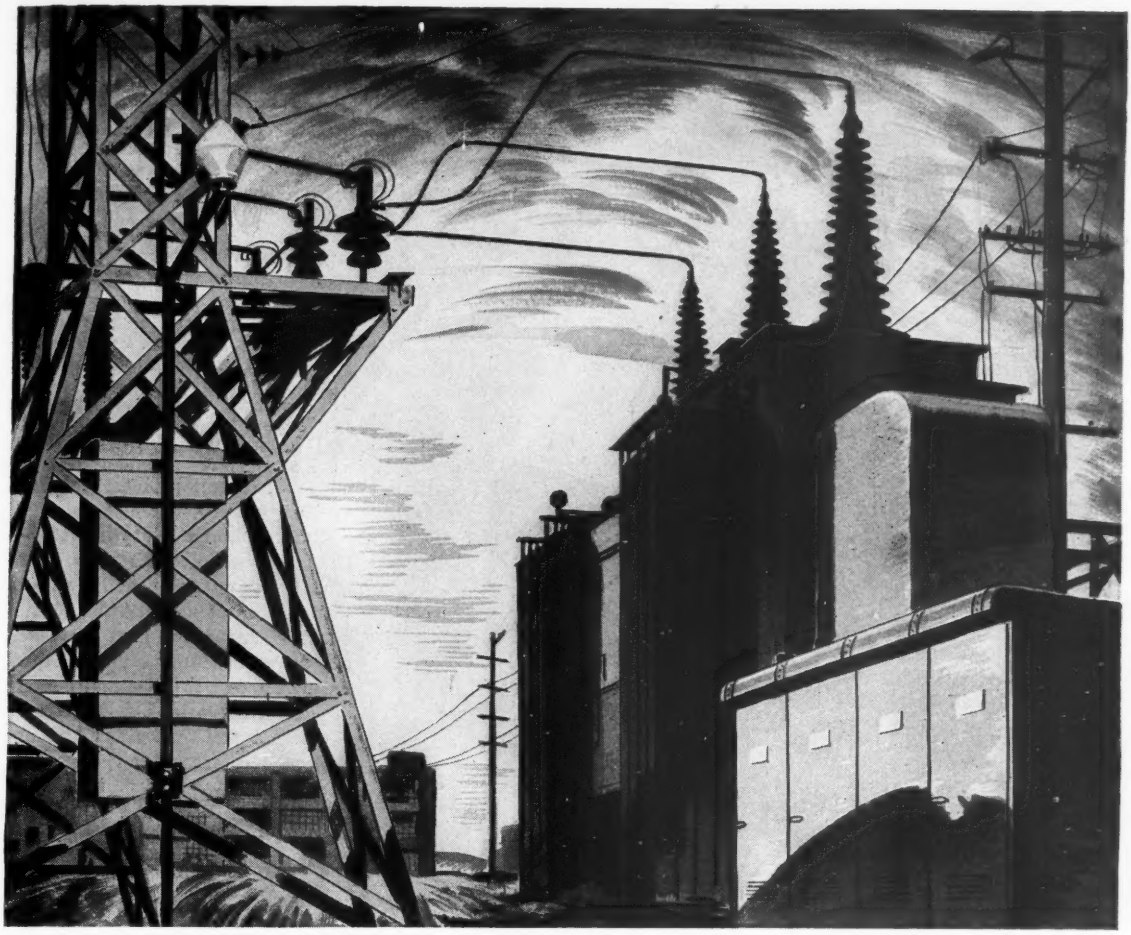
With oil firing, the alkali was high, the Fe_2O_3 low, and the fusion point low. Tar-gas firing gave a low alkali, high Fe_2O_3, and the fusion point was high. Tar and coke gas contains less alkalies and with the greater iron oxide fumes produces a very refractory checker deposit.

With temperatures below the limit of the brick themselves, the first pass checker damage comes about by the deposits melting and fluxing the brick.

Technical features involved in the change to firing high percentages of coke gas in the open hearth without loss of production, follow:

1. This project developed a practical method for burning high percentages of coke gas in the open hearth. The low radiating fuel is at the top of the flame and the high radiating fuel is next to the bath. The liquid fuel controls bath action for heat transfer. The coke gas spplies the remaining heat requirements for the furnace proper and air preheat.

2. Lower alkali checker deposits



More power to you!

In the vital electrical equipment industry, as in practically all other fields, the uses for OSTUCO Tubing are countless. Transformer and header tubes, columns, bushings, bearings, housings, and mounts are only a few of the specific applications in generators, motors, starters, power equipment, and many other electrical products that mean power to you.

Whether your products are electrical or of an entirely different type, you'll be wise to investigate the advantages of OSTUCO Tubing, in improving design, increasing strength, reducing weight, and cutting cost. We cannot always promise early delivery estimates on new civilian orders, because of military demands, but it will pay you to consult our experienced engineers about OSTUCO Tubing when redesigning your products to meet future competition.

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of tar-gas firing permit higher checker temperatures and, therefore, higher air preheat.

3. Relation of heat time, air preheat, and checker deposits with different fuels is important. Any fuel change requires knowing this relationship.

4. Scheduling of fuels during the various periods of the heat and constant follow-up were necessary for converting to new fuels and are still necessary to maintain efficient firing.

5. Coke gas can no longer be considered an inferior fuel. Desulphurized coke gas, supplied at the right pressure and used properly with a small amount of tar, gives an ideal open-hearth fuel, from coal alone. Plants with enough coke ovens have an answer to the high-sulphur oil problems predicted for the future.

Changes in Tin Plate Industry—C. A. Ferguson, general superintendent, Gary sheet and tin mill, United States Steel Co., Pittsburgh, pointed out that increased speeds, attended by higher output, mean less and less manual control of the operations. Electronic equipment for controlling the operation has played an important part. What industry has today in the way of electrical equipment will not be satisfactory tomorrow, it can be assumed from past experience.

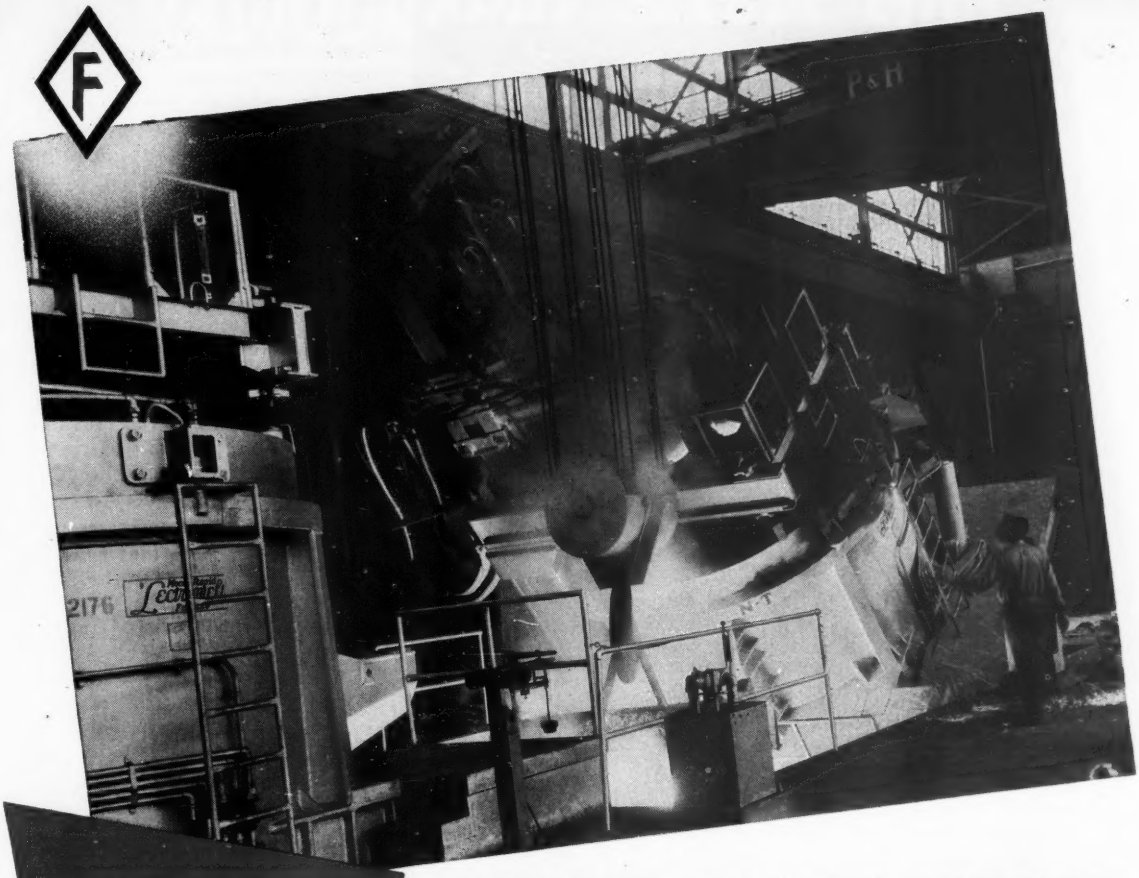
Along with higher speeds comes the tracking problem on strip. Recent developments with automatic centering rolls offer a hope in this direction.

The future holds possibilities for the elimination of some of the present basic processing steps of steelmaking. A typical example is the use of cast slabs, which has drawn the attention of many steel producers. Experimental work has been in progress also on the direct casting of wide flat products.

The use of coils, with their many advantages, by tin plate consumers would result in a considerable investment by many users, but the steel industry has been working toward larger and larger coils in the interest of better costs and handling.

Although there have been great strides in improving corrosion resistance of tin plate, still further advancement is expected.

Ugine-Sejournet Extrusion Process, by J. Strauss, vice president,



ANNOUNCING! *COMPLETE QUALITY CONTROL* with FINKL'S *OWN* ELECTRIC FURNACE STEELS

These NEW twin electric furnaces for making high quality steels are the most modern installation in the country and are housed in a new building complete with up-to-the-minute metallurgical facilities.

The advantage of making the steels for your forgings and die blocks is obvious — quality is our paramount concern. The analysis is assured with the speed and accuracy of a direct reading spectrometer. Temperatures of the molten bath are determined by immersion pyrometers. *Nothing is left to chance.*

Now with this great new advantage of controlling the quality of the steel added to the craftsmanship of Finkl personnel in forging, heat treating, machining and testing, we are proud and pleased that we can serve you with the highest quality die blocks and forgings available today.

A. Finkl & Sons Co.

2011 SOUTHPORT AVENUE • CHICAGO 14

FORGINGS • DIE BLOCKS • ELECTRIC FURNACE STEELS

Do Your **OWN** Hard Chrome* Plating with the CRO-PLATER 100

Thermo-Controlled Heated Bath **Bench or Floor-mounted**
Plate and Strip in the Same Tank **Tank Size 12" x 15" x 12"**
Current Density Input 100 amps. at 0 to 12 volts

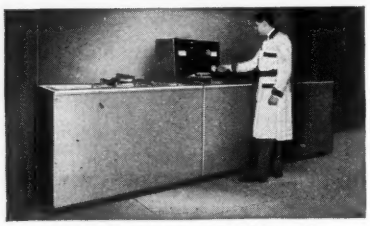
** Plate other metals, too!*

Look at the work you can do with the CRO-PLATER 100:

Flash chrome cutting tools for increased work life... plate in production quantities..."build up" mis-machined or undersized parts... plate to tolerances of .0001"...plate parts for wear, corrosion, erosion resistance ..."throw" chrome effectively on complex I. D. work...no limitations on type of work except size.

FREE FIXTURE DESIGN At no charge, fixtures will be designed for your specific needs. Arrangements can be made with the company to fabricate specialized fixtures.

CRO-SOL, a high speed plating solution Engineered for your individual plating requirements and for use only the CRO-PLATER units is CRO-SOL, a Cro-Plate Company development. This stable solution requires only the addition of water for immediate use and can be maintained indefinitely through periodic analysis.



CRO-PLATER 100 with auxiliary tanks

Auxiliary tanks for hot rinsing and alkali cleaning, cold rinsing and stripping are available in either stainless steel or black iron. Also available are other CRO-PLATERs ranging in size from 50 to 500 amps.

The Cro-Plate Company also maintains a complete Engineering Service Division to help solve your electro-plating problems. For further information . . . for price and delivery quotations . . . for sample work arrangements . . . write

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HARTFORD 5, CONNECTICUT
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747 WINDSOR STREET

Vanadium Corp. of America, New York—With the beginning of commercial hot extrusion of steel and high-temperature alloys in the United States by the foregoing process a statement concerning the development and practice of the method appears opportune.

Comptoir Industriel D'Etirage & Profilage de Metaux, a small private company engaged in cold drawing of metals attacked the problem in the direction of improving the lubrication but soon reached the conclusion that actually there was not one, but two problems in this field that required solution; namely, the lubrication between the billet and the container and between the billet and the die.

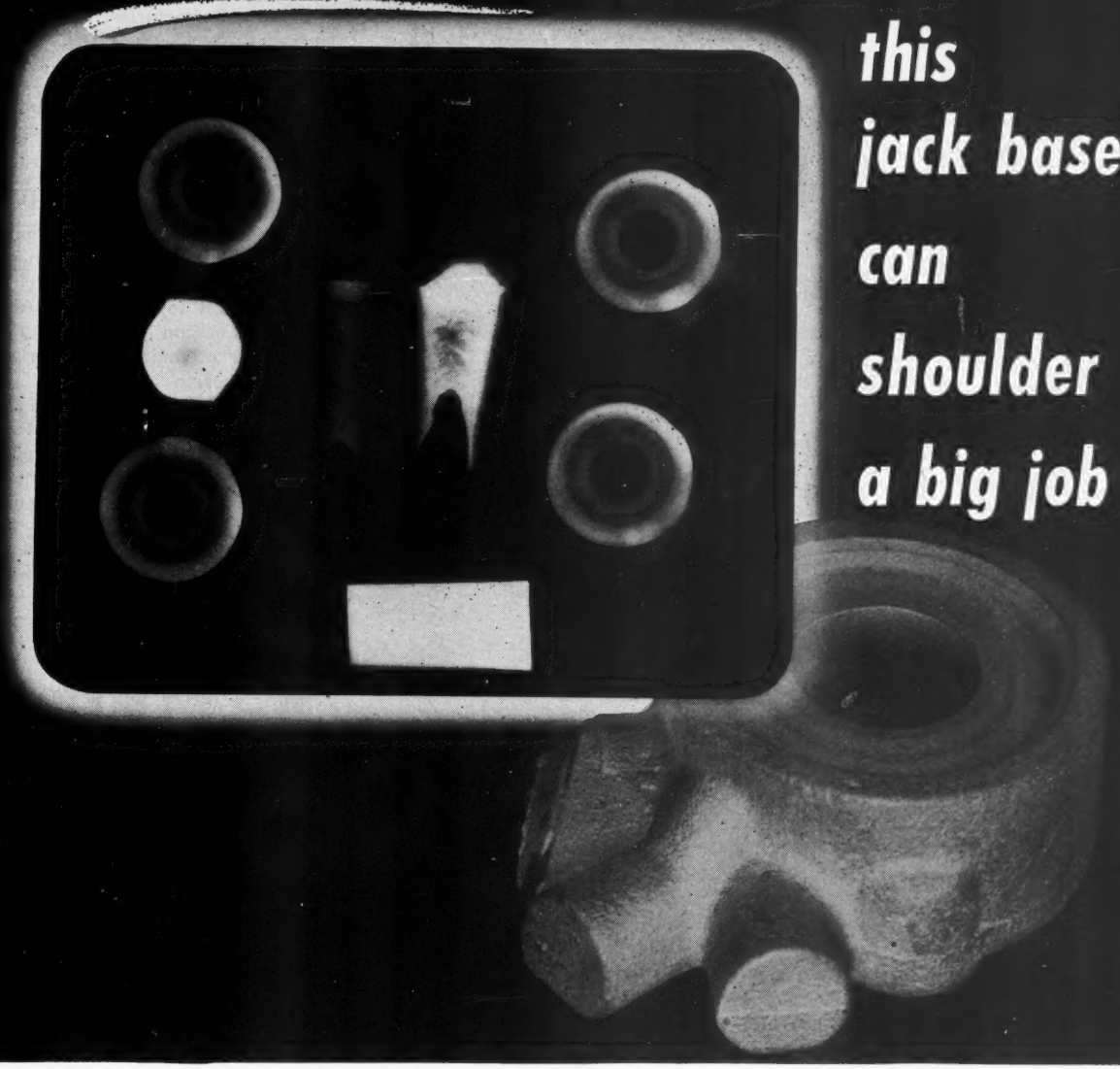
Glass Tried—These experiments led to the discovery that glass, introduced in solid form, was a most useful lubricant and simultaneously served as an insulator, thus effectively protecting the tools from contact with the billet and with the section in course of extrusion, and also from absorption of too much heat therefrom. Later came the concept that any related substance possessing adequately high softening point and adequate viscosity at the operating temperature, and melting over a range of temperature, could supply the necessary qualities. This is the concept that has now been put into practice.

Hundreds of tests undertaken with various kinds of glass and glass-like material pointed to the predominant influence of glass viscosity and glass diffusibility. The quality and quantity of glass employed is influential. The original die and mandrel glass has been replaced by fibrous or woven glass.

Wear of the dies, die holders and container liners is rapid when the surface of the billets is covered with oxides. This problem of surface oxide has been solved, at least temporarily, by final heating in a salt bath, thus removing any oxides formed during preheating while at the same time giving uniform and controlled temperature. The movement of metal through the die when using glass or glass-like lubricants is such that the outer surface of the billet remains at the outer surface of the extruded object and there is a regularity

RADIOGRAPHY MAKES SURE

this jack base can shoulder a big job



Hydraulic jack bases—as cast.

Hydraulic jacks are born to lift loads many times their own weight and size—to stand internal pressures of thousands of pounds per square inch.

This takes sound castings—soundness which only radiography can prove without damage to the part. And the designers, knowing the casting will be sound, can count on strength without excessive weight.

Instances like this show why more and more foundries are making radiography routine. It is the way to be sure only high-quality castings are released.

If you would like to know how radiography can improve your plant operation, talk it over with your x-ray dealer. And, if you wish, we'll send you a free copy of "Radiography As A Foundry Tool."

EASTMAN KODAK COMPANY
X-ray Division, Rochester 4, New York

Radiography...
another important function of photography

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plastic protective equipment

keep you on the safe side

WILLSON MONOGOGGLES®

Workers wear Willson protective equipment willingly because these MonoGoggles® and other safety devices shown are lightweight and comfortable. MonoGoggles® illustrated above are available in flexible *Polythene* and fully transparent *Acetate* for extra side vision. Interchangeable lenses in clear plastic or Tru-Hue green. Ask for Willson—the leading line of respiratory and eye safety equipment for industry, farm and home use.

Choice of clear or green plastic visors

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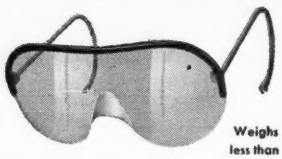

Weighs less than an ounce!

WILLSON FEATHERSPEC®

...specially designed for light-duty operations. Comfortably worn over prescription glasses. Their clear or Tru-Hue green plastic lenses can be switched in a few seconds.

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WILLSON PRODUCTS, Inc., 233 Washington St., Reading, Pennsylvania

of movement of the metal during the operation.

Carbon Refractories for Blast Furnaces, by J. J. Hazel, chief ceramic engineer, Republic Steel Corp., Cleveland—The most important thing that has been gained from the several years' experience in operating furnaces with carbon hearths is that carbon is not a fool-proof refractory. The tap hole area is still vulnerable and must have its share of competent supervision.

The reason for changing from ceramic to carbon hearths was primarily an attempt to reduce or eliminate hearth breakouts.

The time necessary to reline a blast furnace today is a fraction of what it was 15 to 20 years ago. We cannot get the tight, strong, well bonded jobs we used to obtain. We have passed the day of the tough mason inspector who made the contractors tear out any brick work with joints large enough to permit the insertion of a small knife blade.

The drying out time of a new rebuild is decreasing. Likewise the time necessary to go from low wind to full wind on a blow-in is decreasing.

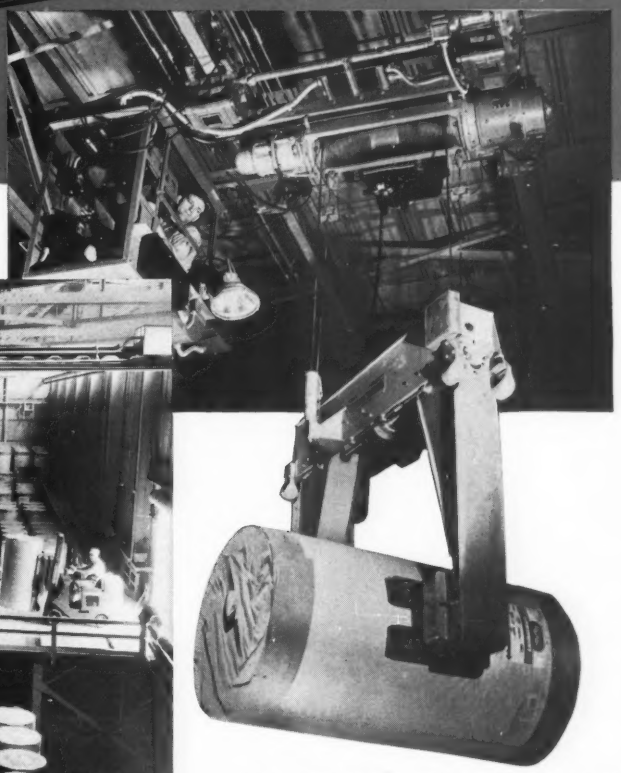
Although some operators still advocate the all-carbon tap hole, the majority feel that ceramic materials are needed as a ring or insert. Many of the all-carbon tap holes have produced high tonnage with little or no trouble. Since most blast furnace operators open the tap hole by means of the oxygen lance and then use a clay with 10 to 20 per cent moisture content to stop the hole, it seems logical to use a small section of ceramic material in this location.

The use of the jet caster for opening the tap hole and the use of an inorganic moisture-free tap hole mud would be of some advantage in preserving the all-carbon tap hole. Both have been used but at the present time the jet caster is finding more use in the open hearth than the blast furnace. The use of the inorganic, moisture-free iron notch mix has not proved practical up to this time.

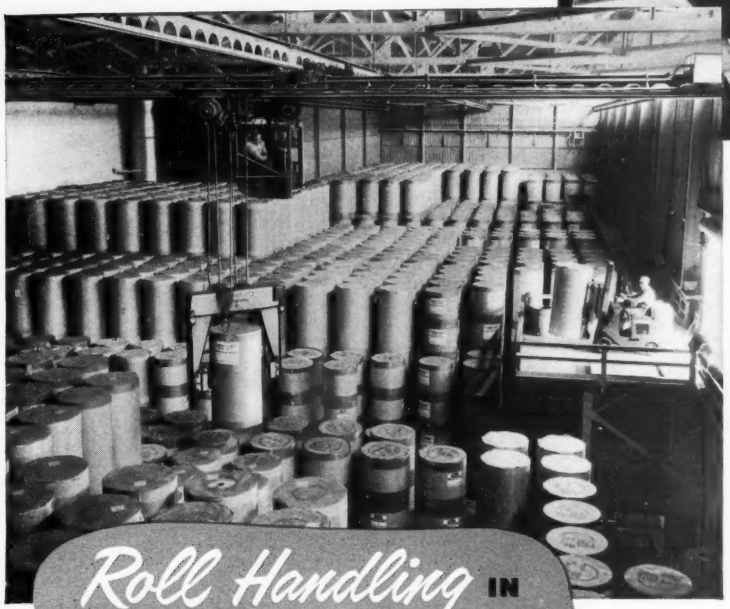
Two important characteristics of carbon must always be taken into consideration. The first is its oxidation rate; the second is its

CLEVELAND TRAMRAIL

THE OVERHEAD TRACK TO
Lower Production Costs



This warehouse has a capacity of 4100 tons. Rolls are piled vertically up to 33' 0" high.



This powerful grab transports rolls without damage and turns them to any position. Most rolls at Oklahoma are 40" dia. x 5' 5" long and weigh 1500 lbs. Other Cleveland Tramrail grabs handle rolls to 6000 lbs., 12" to 60" dia., to 86" long.

Roll Handling IN NATION'S MOST MECHANIZED NEWSPAPER PLANT

TREMENDOUS cost-cutting advantages have been secured with a roll-handling Cleveland Tramrail crane installation in the warehouse of the Oklahoma Publishing Co., publishers of the *Oklahoman* and *Times*, leading Oklahoma City newspapers, listed as follows:

1. Virtually all warehouse damage to paper has been eliminated. This formerly amounted to as much as 5 tons a month.
2. Conserves space because areas formerly used for aisleways are now used for storage.
3. Vertical piling permits storing far more rolls, because space formerly lost with out-moded method of pyramiding rolls horizontally is utilized.
4. Vertical storage means that paper stocks can be dated upon arrival at warehouse and used in order received.
5. Back-breaking labor formerly required for handling rolls is eliminated.

The Tramrail cranes pick the rolls up whether in horizontal or vertical position and stack them on end, the entire job being controlled from the crane cab. 4000 tons are handled monthly—2000 tons into storage and 2000 tons out.

Whether you have rolls of paper or steel to handle, glass, lumber, cloth or machinery, Cleveland Tramrail can help you. Most likely you can obtain exciting advantages with a well-planned installation.

GET THIS BOOK—Write for a free copy of Book 2008. Packed with valuable information, this well-illustrated book starts you thinking of ways you can step up production and lower costs in your plant

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO
7895 EAST 284th ST. WICKLIFFE, OHIO

CLEVELAND TRAMRAIL

THE OVERHEAD TRACK TO *Lower Production Costs*

Four motor-driven push-button-controlled gantries work under the heavy overhead crane in the Heavy Duty Turret Lathe Assembly of Warner & Swasey Co. The vast amount of hand fitting and scraping calls for a great deal of localized lifting and handling. The gantries provide this service and eliminate "down" time waiting for the overhead crane.

Single Leg Gantries . . .

Little Cranes That Give Production a Big Boost!

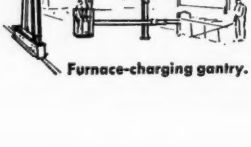
PRODUCTION and methods engineers in many plants charged with finding ways of boosting production have *rediscovered* gantry cranes. They have put them to work in greater numbers, and by so doing have stepped up output in varying amounts, often by exciting percentages.

Where large overhead traveling cranes are used, single-leg gantries have been found particularly valuable. They serve as helping hands to the large cranes. The usual procedure is to provide a number of gantries, one for each local area, and a large overhead crane for an entire shop bay. The gantries take care of the light local or spot handling and the heavy overhead cranes do the heavy lifting, traveling from one end of the bay to the other.

Because single-leg gantries are relatively inexpensive, several can usually be purchased for less than the price of an additional large overhead crane. Thus through their use far better handling can be provided at a lower initial investment.

CLEVELAND TRAMRAIL GANTRY CRANES are Built for Either Manual or Electric Operation.

Two lines of gantries under heavy overhead crane.



Furnace-charging gantry.

Cleaning house gantry.

Hand-propelled gantry.

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high thermal conductivity. In the design and construction of a carbon hearth proper engineering must always take into consideration these two factors. Proper consideration of the high thermal conductivity of carbon can be utilized to reduce its oxidation to a negligible amount.

Further Standardization

G.S.A. promises greater adoption of industry standards under new authority

FEDERAL government and military services will begin using industry and technical society standards "to the maximum extent practicable."

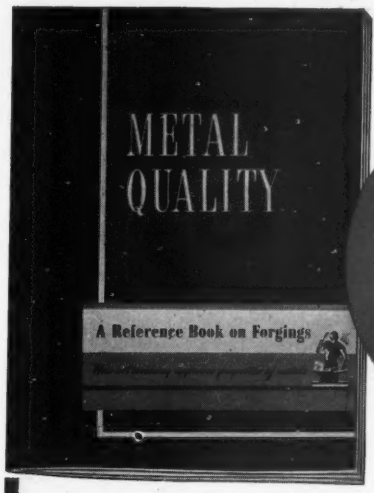
This promise was made by Willis S. MacLeod, director of the standards division, General Services Administration. Mr. MacLeod addressed the standards council of the American Standards Association recently in New York.

Official Recognition—He reports that "For the first time, there is official recognition, supported by statute, that nationally recognized standards and specifications shall be used. Under this plan and the policies it establishes, the administrator (of General Services) has authority to decide when specifications are justified and when not."

Mr. MacLeod emphasizes that it is not GSA's intention to direct its efforts in the field of military combat or special military items. It will concentrate its program on items in common use. The GSA directive provides that normally this will be done by reference or by transcription from industry and technical society standards or portions thereof. Result will be issued as co-ordinated or interim federal or military specifications or standards, without deviation.

Only the Beginning—GSA, he says, has adopted 45 American standards, chiefly in the field of photographic supplies. He described this as a considerable standardization over items that had been used under preceding specifications.

"Analysis indicates," he adds, "that we can adopt possibly 210 American standards in the federal specifications."



Engineering, production and economic advantages obtainable with forgings are presented in this Reference Book on forgings. Write for a copy.

Forgings fortify a mechanism with a factor of greater safety that is otherwise unobtainable... There is no substitute for the toughness and strength inherent in the compact, fiber-like flow line structure of closed die forgings. Consult a Forging Engineer about the correct combination of mechanical properties which forgings can provide for your product.

DROP FORGING ASSOCIATION
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Please send 60-page booklet entitled "Metal Quality — How Hot Working Improves Properties of Metal", 1949 Edition.

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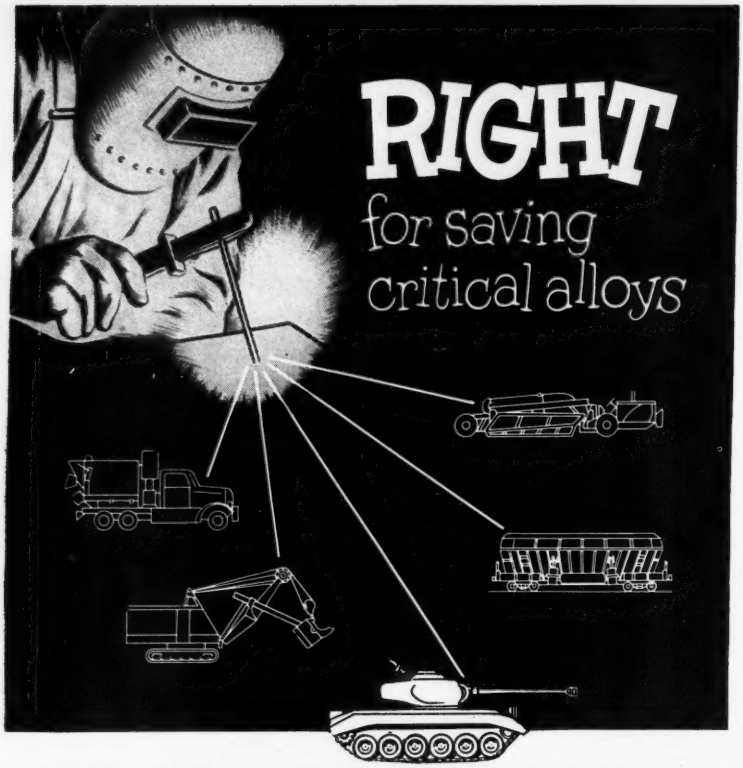


ARCOS Low Hydrogen Electrodes weld high tensile steel with savings in chromium and nickel

ARCOS LOW HYDROGEN ELECTRODES
Tensilend 70
Tensilend 100
Tensilend 120
Manganend 1M
Manganend 2M
Nickend 2
Chromend 1M
Chromend 2M

Time and service have proved the effectiveness of welding high tensile steel with Low Hydrogen Electrodes. And today's heavy demands for freeing critical alloys make their use more timely than ever before.

First developed in 1942, Arcos Low Hydrogen Electrodes are subjected to the same rigid quality controls as applied to its Stainless. That's your assurance of uniform, high quality weld metal for use on armor and other commercial applications. It means sound, dependable welds on every job, every time. Arcos offers the most complete selection of Low Hydrogen Electrodes in the field.

ARCOS CORPORATION • 1500 South 50th St., Philadelphia 43, Penna.

Write for new booklet "The ABC's of Welding High Tensile Steels"

WELD WITH ARCOS

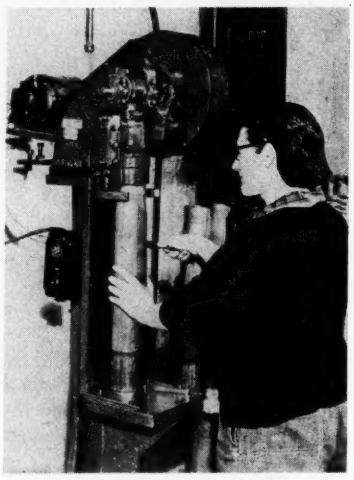
Specialists in Stainless, Low Hydrogen and Non-Ferrous Electrodes

Small Press; Bigger Job

Half-press shows sufficient shut-height to get 4-ton units into munitions work

LOW tonnage punch presses are ordinarily precluded from performing many munitions jobs because of their small shut-height. A development by Benchmaster Mfg. Co., Los Angeles, indicates a new field in application of the smaller units.

Conventional presses in the 4-ton range usually have about 8 inches shut-height. To expand this limit, Benchmaster introduced a machine it calls the Half-Press. This model consists of the upper



LOW TONNAGE PRESSES
. . . new design for munitions work

half of the press frame—complete with ram, crankshaft, flywheel and the clutch mechanism with its trip lever. The frame is severed below a reinforcing cross brace between the two column members and the web drilled to bolt the frame to any required base.

Simple Conversion—In a typical application, the machine is set up for nibbling the ends of shell cases to establish accurate length and smooth trim. Subframe consists of a casting to which a cylindrically shaped die is attached. In effect, the converted machine becomes a horning press.

Die has about the same inside diameter as the shell cases. Its rectangular slot is mated to the 1¼ x 1½-inch punch fitted in the ram. Pilot extension supports the

case at its outer extremity on the two small rollers. Ram operates continuously at 285 strokes per minute.

Greater Shut-Height — Another application permits conversion for sizing. This created a big problem in attaining sufficient shut-height. Solution results from securing the half-press to a T-section frame.

Bed is thus located 18 inches or more below the punch. Shell cases are centered manually under the punch by two v-shaped fixtures. Punch instantly opens the necked-down portion, establishing the finished inside diameter.

Tube Furnace Job Projected

Double-zone slab heating furnace will be constructed by Rust Furnace Co. to serve the pipe mill being built by National Tube Division, U. S. Steel Co. at Morrisville, Pa. A continuous, recuperative type, the heater will be equipped for top firing by coke oven gas, natural gas or oil. It will have a 43-foot width inside with an effective heating length of 60 feet, provided with full automatic controls for combustion, pressure and temperature. Slabs will be side charged and side discharged.

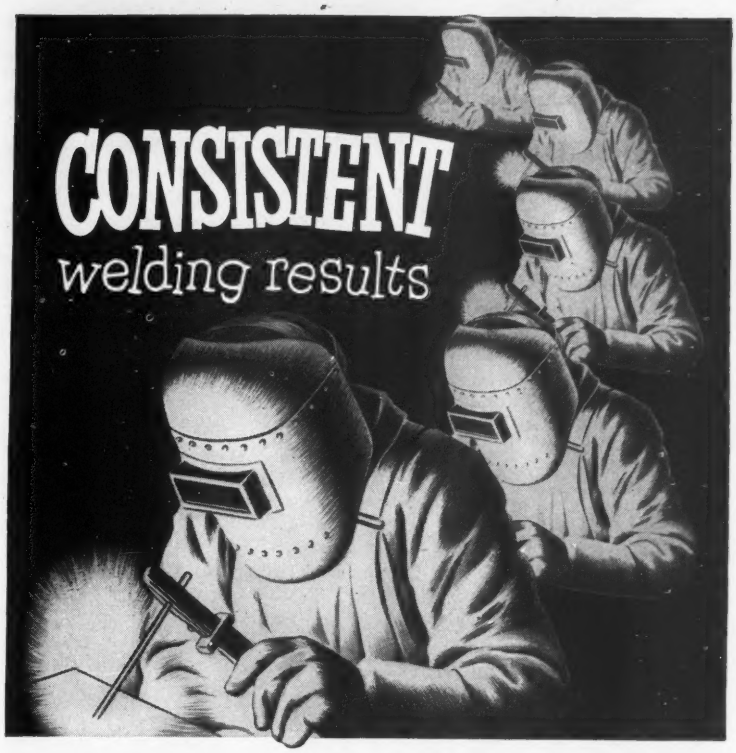
Movie Shows Motor Application

Color and sound movie featuring development and application of internally-geared electrical motors is released by U. S. Electrical Motors Inc., Los Angeles. Production is designed to aid electrical and maintenance men who want to observe methods for applying geared power and understand design and characteristics of motors in this classification. The 20-minute movie shows close-ups of the company's Syncrogear motors under construction and installed for a variety of jobs.

Catalog Condenses Scale Line

Condensed scale catalog, published by Howe Scale Co., Rutland, Vt., shows a complete line of scales for industrial applications. It includes a selection of 1000 of the company's standard units weighing from 1/64-ounce to 400 tons.

Edited as a compact copy of the



ARCOS Stainless Electrodes assure you quality weld metal—easily deposited—time after time

You know the need today for producing sound, dependable welds on every job. It can mean savings in time, money and electrodes.

Benefits like these are yours with every box of Arcos Stainless Electrodes you receive. For each is backed by quality control tests more rigid than anywhere in the industry. That's why you can always count on Arcos for weld metal that is chemically, physically, and metallurgically of the highest type. It assures you of improved welding performance . . . more dependable results at lower weld costs.

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WELD WITH

ARCOS

Specialists in Stainless, Low Hydrogen and Non-Ferrous Electrodes

firm's 200-page catalog, the 28-page reference contains complete specifications, spot illustrations and is held to only essential data.

Magnesium for Industry

As an aid in the production of lighter equipment, a handbook of basic information on industrial application of magnesium alloys is released by the Defense Department.

Booklet contains information on the magnesium industry, properties of the metal, structure and design for extrusions and forgings and recommended shop practice.

Photos, drawings, graphs and tables are included in this booklet, which sells for $2.00 a copy. Orders should be addressed to the Office of Technical Services, U. S. Department of Commerce, Washington 25.

Refractory Standards to Date

New edition of the American Society for Testing Materials manual on refractory materials standards has been published by the society, superseding the 1948 copy. The edition summarizes in latest approved form the 37 ASTM standard and tentative specifications, classifications, test methods and definitions.

Publication is sponsored by the society's committee C-8 on refractories. It reports other information of value in refractory testing and use, such as suggested procedure for calculating heat loss through furnace walls and practice for use with panel spalling tests.

New material includes methods of test for modulus of rupture and for permanent linear change on firing of castable refractories. Test method is proposed for disintegration of fireclay refractories in an atmosphere of carbon monoxide. Subject and author index supplements the usual table of contents and numeric sequence.

Copies of the 304-page manual can be obtained from the society for $3.

Stainless Arc Welding Expanded

New factory facilities for making extremely thin stainless steel and phosphorus arc welded diaphragms are announced by Bristol Co., Waterbury, Conn. Thicknesses of 0.0015 to 0.005-inch for pressure transducers, pressure elements and seals for many instrument and aircraft applications are being welded.

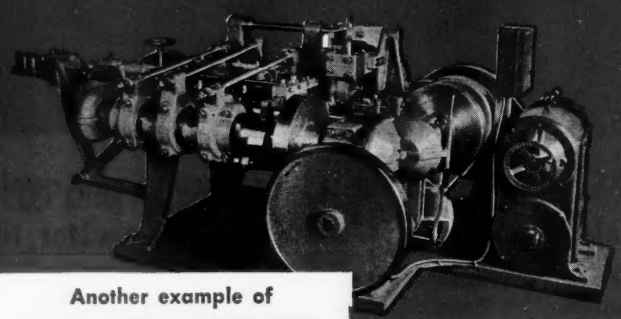
Surface Tension at a Glance

Quick and accurate surface tension measurements can be made under production conditions with the Sur-Ten meter. This is the claim advanced by designer Joseph B. Kushner.

Instrument consists of two matched glass plates held together at a small fixed angle by a permanently mounted stainless steel wedge and removable spring clamps.

On one plate, permanently engraved, is a liquid level line and a graduated scale at right angles. If the two cleaned glass plates are placed vertically in the solution to be tested and submerged up to the level line, the solution will rise between the plates by capillary action in the form of a smooth

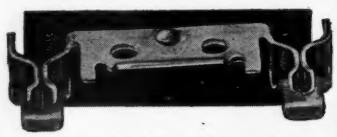
PRODUCTION RECORDS *Broken*
with NILSON 4-SLIDE *Machine!*



Another example of
FASTER, LOWER COST FORMING
of Ribbon Metal Stock

★ *180 Terminal Contacts* **Per Minute**

★ *7 Separate Operations* **Eliminated**



A famous national manufacturer tripled production of the Terminal Contact illustrated above (in actual size) and reduced production costs proportionately by replacing several progress die set-ups with one Nilson S-3-F four side machine. *Seven separate operations were eliminated;* 180 completed contacts produced per minute. Time required for tooling changes was reduced 50% over similar type machines.

This example clearly shows the big savings you can make in overhead, maintenance, labor and time with a Nilson 4-slide!

Taking stock directly from the coil, NILSON metal ribbon stock four-slide machines automatically feed, straighten, pierce, blank, swage, stamp, coin, cut off and perform up to five forming operations with speed and accuracy. Built in five models with capacities up to 2½" wide and feed lengths up to 15". For specific recommendations on your wire and ribbon metal forming problems, send details, prints or samples of your operation to us when you request the bulletin.

THERE'S NOTHING LIKE A NILSON

Specialists in Wire Forming Equipment for Over 50 Years

THE A. H. NILSON MACHINE COMPANY

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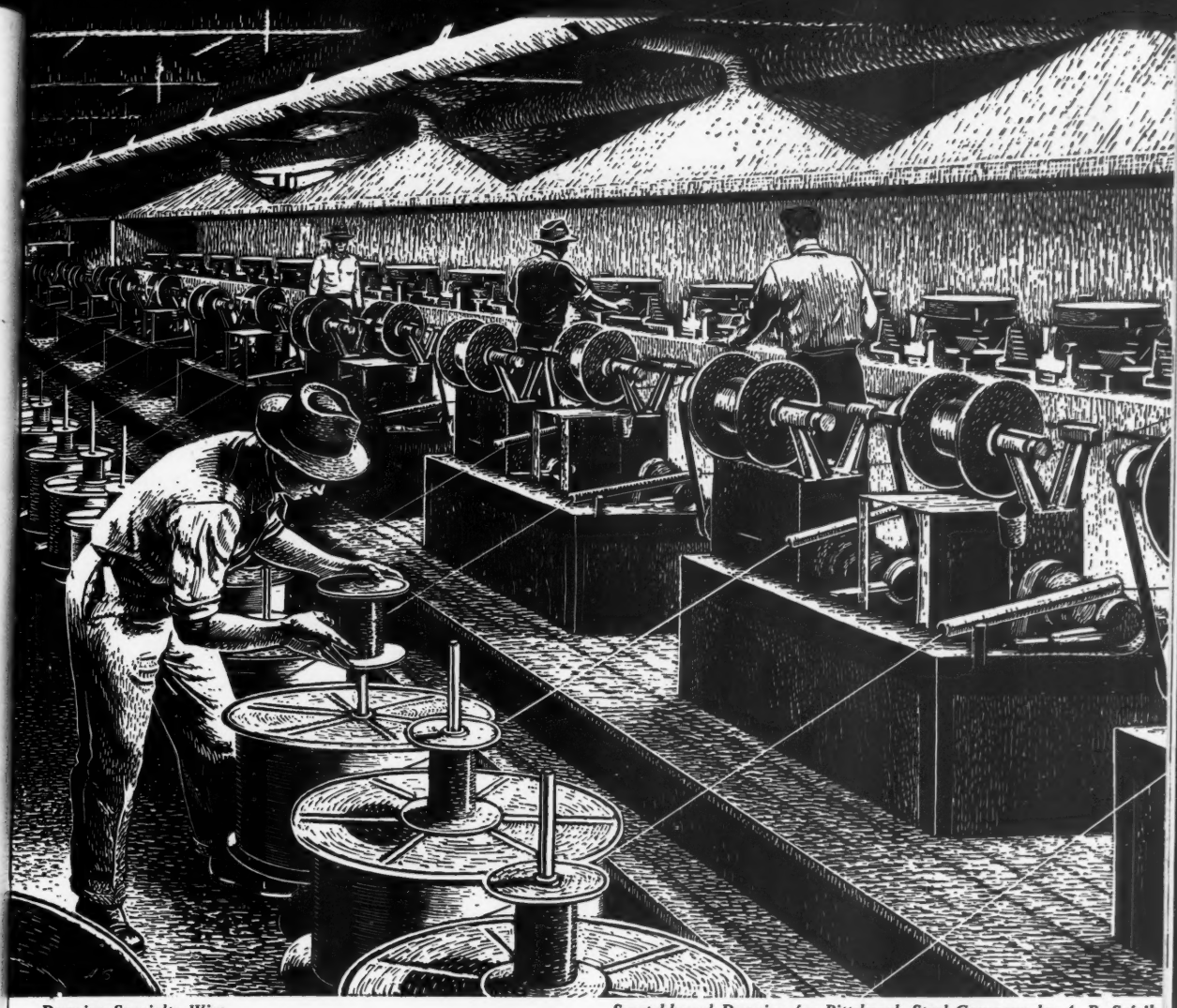
OTHER NILSON PRODUCTS:

- Automatic chain-making machines
- Automatic staple forming machines
- Wire and Stock reels
- Foot Presses
- Wire straightening equipment
- Slide Feeds for Presses



Drawing Specialty Wire

Scratchboard Drawing for Pittsburgh Steel Company by A. B. Sefcik

Progress in Steel . . . *Makes More Precision Wire*

A Pittsburgh Steel Company subsidiary, the Johnson Steel & Wire Company, Inc., has devoted its activities for twenty-five years to the production of high-carbon fine and specialty steel wire.

The high quality of this wire depends in part upon the inherent soundness of the steel rods supplied to this subsidiary by Pittsburgh Steel, where through its Program of Progress, steps are being taken to increase steel production and maintain high-quality output. This $60-million expansion and modernization plan provides for increases of 82% in its finished product capacity and 50% in ingot capacity. The major steps in the program are outlined here in a table.

When completed, one effect of the Program of Progress will be reflected by increased production in the three Johnson plants at Worcester, Massachusetts; Akron, Ohio and Los Angeles, California, as well as in the parent rod and wire mills at Monessen, Pennsylvania. From these wire mills comes an endless variety of special wires which are vital to manufacturers of mechanical springs, automobile tires, rubber hose, textiles and wire brushes. Other special varieties range from wires used in aircraft controls to surgical instruments—from musical instruments to fishing lines—from bobby pins to shade rollers, to name but a few. Some of this special purpose wire is so fine that more than three miles of it is contained in a single, one-pound coil.

The Program of Progress at Pittsburgh Steel is planned to increase production and diversify the Company's line of wire, tubular and flat-rolled products in order to serve its customers better. In turn, they will be able to intensify their efforts and produce more and more items necessary for building a Nation strong enough to meet any emergency.

PROGRAM OF PROGRESS

Thomas Strip Division Acquired
New High Lift Blooming-Slabbing Mill Installed
Increasing Blast Furnace Capacity by 12%
Increasing Open Hearth Capacity by 50%
Installing new 66-inch Hot Sheet-Strip Mill
Installing new 66-inch Cold Rolled Sheet-Strip Mill

Pittsburgh Steel Company

Pittsburgh, Pennsylvania

Small orders...

Large orders...

you can depend on the...

top 10 SOURCES for Mechanical Springs

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BARNES-GIBSON-RAYMOND
40300 Plymouth Rd.
Plymouth, Mich.

B·G·R COOK PLANT
Ann Arbor, Michigan

F. N. MANROSS AND SONS CO.
Bristol, Connecticut

OHIO DIV.
Associated Spring Corporation
1712 East First Street
Dayton, Ohio

DUNBAR BROS. COMPANY
Bristol, Connecticut

MILWAUKEE DIV.
Associated Spring Corporation
341 East Erie Street
Milwaukee, Wisconsin

THE WALLACE BARNES COMPANY LTD.
Hamilton, Ont., Canada

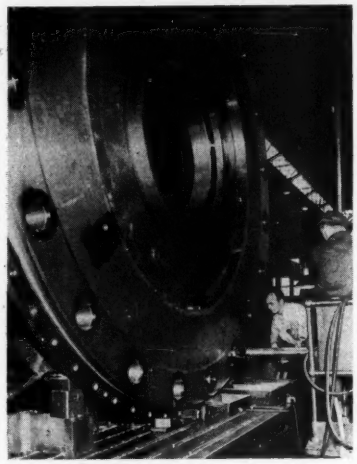
curve. Scale reading at the point where the curve cuts the scale is a measure of liquid's surface tension.

ASME Meets June 16-19

Twenty-one divisions and committees of American Society of Mechanical Engineers and five other engineering societies will participate in ASME's semiannual meeting in Cincinnati, June 16-19. Headquarters will be the Sheraton-Gibson Hotel.

Groups co-sponsoring sessions with ASME are American Society for Testing Materials, American Society of Lubricating Engineers, Society for the Advancement of Management, American Institute of Industrial Engineers and Engineering Society of Cincinnati.

Effect of international tension on the technical world will be discussed by two speakers. R. J. S. Pigott, society president, will discuss the position of the engineer in these times. William C. Foster, deputy secretary of defense, will consider technology in a troubled world. Another important address is one planned by management and production engineering divisions. At their joint luncheon, J. G. Pleasants, Proctor & Gamble, Cincinnati, will analyze



Proper Position

Headcover for an 18,000-hp turbine, to be installed at Ft. Gibson, Okla., is bored for gate stem bushings. To gain sufficient accuracy, headcover is positioned on the boring mill and boring bar centered over each machined button with a dial indicator. Job was done by Baldwin-Lima-Hamilton Corp.

Do you pack and handle your product in crates?

Whatever you make, pack or handle, STANDARD CONVEYORS can speed operations

Material handling often constitutes as much as 50% of total production cost — cut handling costs and you cut production cost.

More than 45 years' experience qualifies Standard to be of expert service on any "package" conveyor need — roller, belt, slat, chain, push-bar, sectional, portable self-contained conveyor units — spiral chutes — pneumatic tube systems. Write —

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Write Dept. ST-52 for Standard's General Catalog and tell us what you want to convey. Address Dept. ST-52.

ROLLER • BELT • SLAT • CHAIN • WHEEL
PUSH-BAR • SECTIONAL
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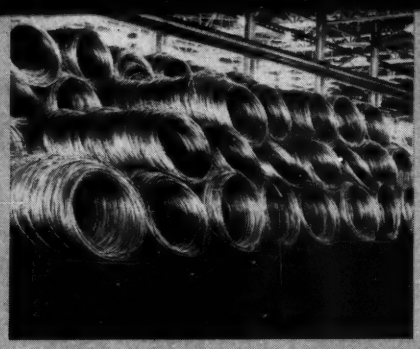
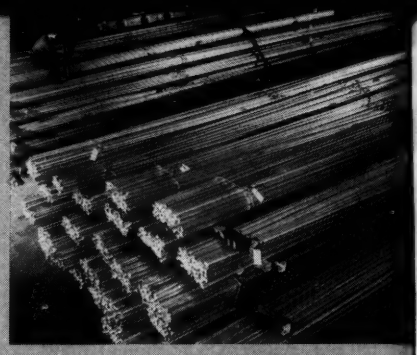
HANDIBELT • HANDIPILER
INCLINEBELT • LEVEL BELT • EXTENDOVEYOR
UTILITY BELT-VEYOR • HANDI-DRIVE
VERTICAL LIFTS • PNEUMATIC TUBE SYSTEMS

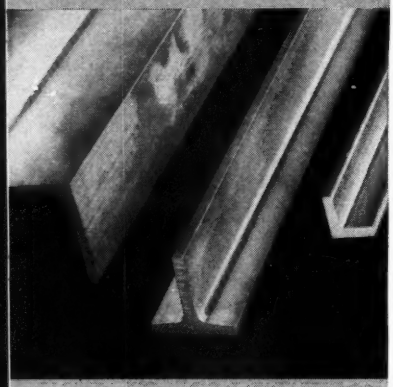
SHEET AND PLATE: Flat and coiled sheet; circles; patterned sheet; plate; tread plate; roofing and siding sheet; roofing accessories and fasteners; specialty sheet.



WIRE: Coiled and straight lengths; rivet wire; flattened and slit wire.

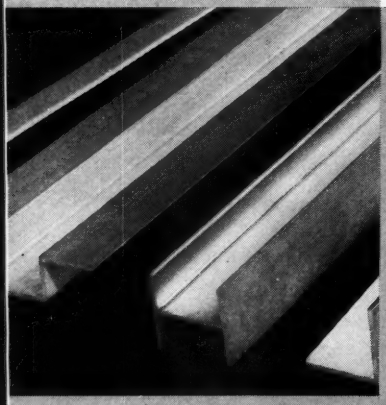


SCREW MACHINE STOCK: All free-cutting alloys plus the higher strength alloys—24S, 61S and 75S.

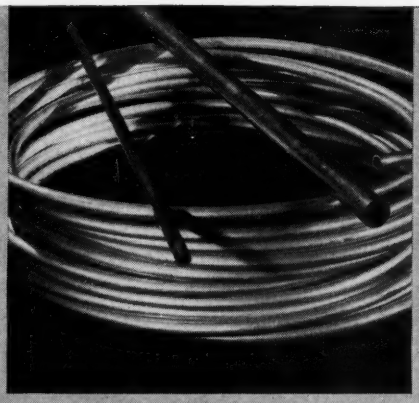


ROLLED SHAPES: Equal angles; unequal angles; channels; I-beams; H-beams; Tees; Zees.

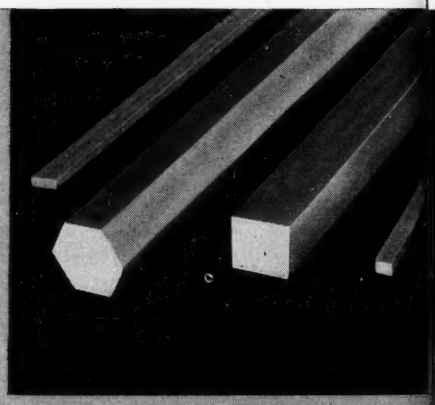
These are the MILL PRODUCTS *of* ALCOA



EXTRUDED SHAPES: Miscellaneous extruded shapes such as angles, channels, half rounds, quarter rounds, thresholds, truck corners, structural members, etc. Round, square, and rectangular bars.



TUBE AND PIPE: Coiled tube; straight tube in round, square and rectangular shapes; heat exchanger tubes; standard pipe and pipe fittings; irrigation pipe; rigid conduit.



BAR STOCK: Square, hexagonal and rectangular bar stock in free-cutting and higher strength alloys.

NOW 6:30 P.M. EDST every Sunday—"SEE IT NOW" with Edward R. Murrow . . . brings the world to your armchair . . . CBS Television

ALUMINUM COMPANY OF AMERICA

They have these 12 basic advantages and scores of others

• Light Weight • High Resistance to Corrosion • High Electrical Conductivity • High Conductivity for Heat • High Reflectivity for Light and Radiant Heat • Workability • Non-Toxic • Strength in Alloys • Non-Sparking • Non-Magnetic • Appearance • High Scrap and Re-Use Value

They are available from your local ALCOA sales office, distributor or jobber, subject to government regulations

For help in interpreting government regulations and all possible co-operation in filling your rated orders, call on your local Alcoa sales office, distributor or jobber. You'll find them listed under "aluminum" in your classified phone book.

With them goes the skill in fabricating, assembling and finishing of 64 years of aluminum knowledge

This know-how plus the help of the world's greatest aluminum research and testing facilities is available to you through your local Alcoa sales office.

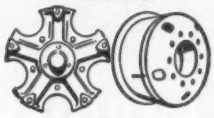
There are no restrictions on the aid and know-how that go with them

For technical literature and movies to train your personnel, for the personal help of Alcoa sales engineers, for the long-range research and testing of aluminum for your products, call your local Alcoa sales office.

ALUMINUM COMPANY OF AMERICA
1808E Gulf Building • Pittsburgh 19, Pa.

ALCOA ALSO MAKES PRODUCTS TO CUSTOMER SPECIFICATION

CASTINGS . . .
sand, plaster, permanent mold and die.

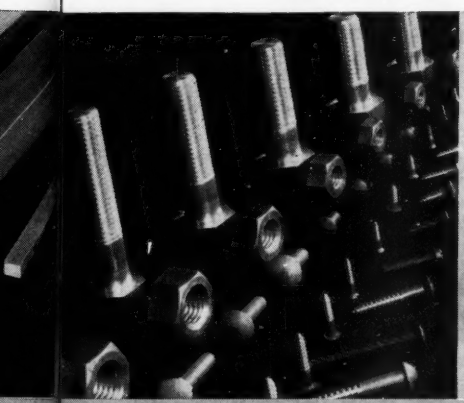


FORGINGS . . .
drop, hammer and press forgings.

SCREW MACHINE SPECIALTIES . . .
special fasteners and screw machine parts.

IMPACT EXTRUSIONS

EXTRUDED SHAPES



FASTENERS: Machine screws, wood screws, washers, nuts, bolts, rivets.

WELDING AND SOLDERING SUPPLIES: Welding and brazing wire, welding and brazing flux, solder flux, solder.

ALCOA *first in* ALUMINUM

ALCOA ALUMINUM

ENGINEERS

TO DESIGN, REDESIGN, OR DEVELOP YOUR PRODUCT

ENGINEERS

TO TOOL AND EQUIP YOUR PLANT FOR THE BEST PRODUCTION ECONOMICS

ENGINEERS

TO GET YOUR NEW PRODUCTION GOING AND KEEP IT GOING

ENGINEERS

TO REDUCE YOUR COSTS AND IMPROVE YOUR QUALITY

ENGINEERS, DESIGNERS, CONSULTANTS AND PRODUCTION SPECIALISTS

PIONEER ENGINEERING & MANUFACTURING CO., INC.

19662 JOHN R STREET
DETROIT 3, MICHIGAN

INQUIRIES PROMPTLY ANSWERED

engineering in management.

Problem of preventing air pollution is the problem planned for an entire fuels session. Four papers dealing with design, installation and application of fuel burning equipment are scheduled. Selecting and training power plant personnel are topics for consideration at a power session in which five papers will be heard.

Future in Corrosion

Researchers are coming up with the answers to many metal protection problems

FUTURE of corrosion problems and work was discussed by H. H. Uhlig, head of the corrosion laboratory at M.I.T., at the Northeast Corrosion Conference in New York.

Dr. Uhlig sees application of cathodic protection extended to protect metals against stress corrosion and fatigue. The protection will be provided by metallic coatings. In addition, the achievement of pore-free nickel coatings will permit the use of thinner coatings of this corrosion resistant metal.

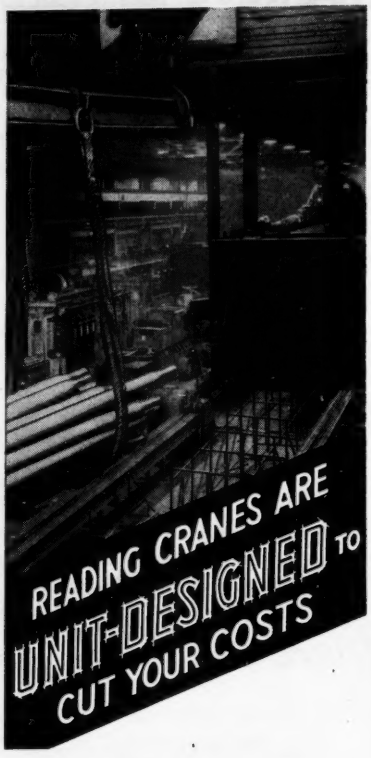
Zinc for Nickel—Possible substitute for nickel will be bright zinc or zinc alloy coatings protected by a clear lacquer. Nickel-molybdenum coatings will be used for plating steel in contact with hydrochloric acid and sulphuric acid.

Titanium, although expensive, will be used for cladding steel in hot water tanks to resist pitting and corrosion cracking in chloride containing waters. Titanium cladding will be used on metals exposed to mine and other acid waters.

Sacrificial metals (zinc, aluminum) will continue to be used. Aluminum can be electro-deposited on copper from an organic bath to give resistance to nitric acid. Aluminum coatings on steel will provide resistance against atmospheres containing sulphur compounds.

Wash primers will come into wider use since they save labor by combining surface treatment and priming into one operation.

News for Paint—Paint formulation is becoming more scientific. A paint which lasts twice as long as another is economical at four



When you have a READING CRANE installed in your plant, you get a crane CUSTOM-BUILT to meet your specific materials handling operation—at no added engineering cost!

Known as UNIT DESIGN, this unique method of crane construction reduces your costs in 2 ways.

1. LOWERS FIRST COST — Because READING CRANES offer you a choice of several interchangeable motor, control and hoisting units, you buy no "extras" to solve special handling problems.

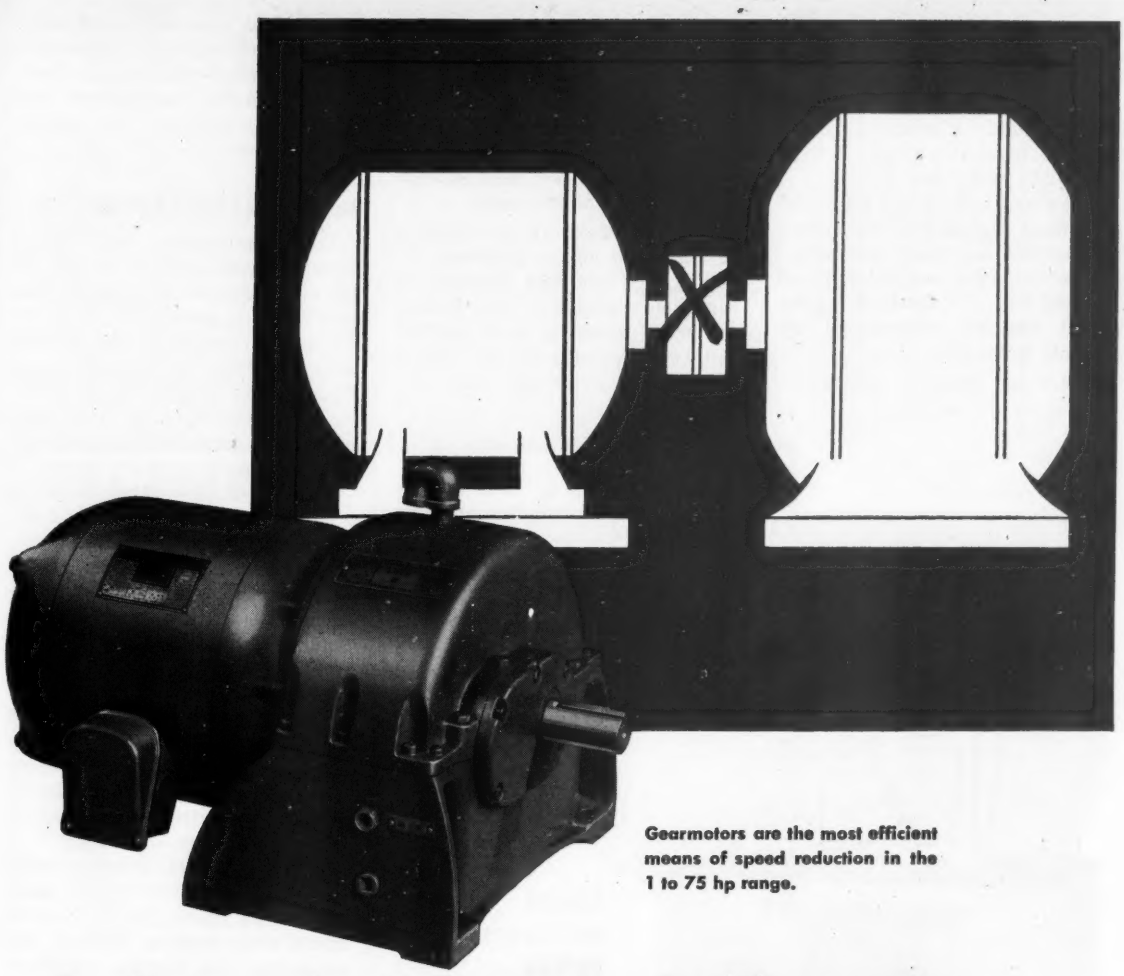
2. REDUCES MAINTENANCE COSTS —All of the operating parts in a READING CRANE are easily accessible for overhaul or repair. The UNIT DESIGN feature makes it possible to remove any one unit without expensive "breaking down" of other units.

See your distributor for information on how you can get a READING CRANE "tailor made" to your own specifications. Drop us a line for your free copy of "The Why and How of Faster Production."

READING CRANE & HOIST CORPORATION
2102 ADAMS ST., READING, PA.

CHAIN HOISTS • ELECTRIC HOISTS
OVERHEAD TRAVELING CRANES

READING CRANES



Gearmotors are the most efficient means of speed reduction in the 1 to 75 hp range.

Small size and unit construction simplify mounting of Life-Line GEARMOTORS

Gearmotors provide the ultimate in compactness. Life-Line Gearmotors give you this compactness, plus many exclusive features not available in any other make. When mounting space is at a premium—Life-Line Gearmotors simplify the problem.

They are self-contained . . . can be installed quickly and conveniently. There's no handling, mounting and aligning of a separate motor, coupling and subbase or bedplate.

Life-Line Gearmotors also offer you these advantages: fewer moving parts, require less maintenance—are easier to inspect and service—are designed, built and serviced by ONE manufacturer.

Use the most efficient means of speed reduction. Use Life-Line Gearmotors. Call your Westinghouse representative for the facts, or write to Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania.

J-07310

YOU CAN BE SURE . . . IF IT'S Westinghouse

WESTINGHOUSE

Life-Line GEARMOTORS

times the price. This fact will permit the incorporation of tetrafluorethylene, a corrosion resistant material, at elevated temperatures into coatings. A means must be found to bond the tetrafluorethylene to the underlying metal.

Glass coatings have a future in glass-lined piping and other uses because they are cheap and impermeable to oxygen and water. Their susceptibility to fracture under impact can be compensated by cathodic protection.

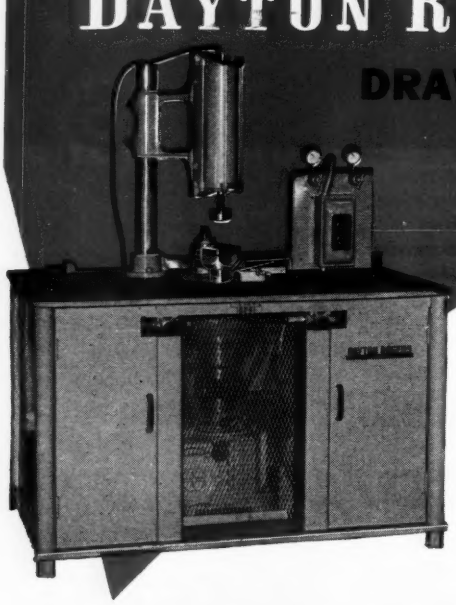
Steam for Pipes — Metaphosphates have a good future as corrosion inhibitors. The field of altering the corrosion environment by steam deaerating of the water will be extended to municipal water systems to reduce the corrosion by oxygen in all the lines between the reservoir and the users.

Increased degree of purification of aluminum and magnesium will result in a 100-fold increase in corrosion resistance. The French are now producing such purified metals. Aluminum will be used to a greater extent in salt water, deactivated of iron and copper salts.

In the field of high temperature alloys, an alloy composed of aluminum, chromium, molybdenum and iron will supplement the nickel-chromium alloys.

DAYTON ROGERS

DRAWN SHELL TRIMMER



LOWER DIE COSTS— BETTER PRODUCTION ON LONG OR SHORT RUNS

The new Dayton Rogers Drawn Shell Trimmer was especially designed to trim square or rectangular shells with small corner radii. It will also bead, knurl, form, serrate, stencil, offset, and bevel. All such shell finishing operations are performed quickly, accurately, and efficiently in one work cycle. It will handle drawn shells of practically any depth and of thickness up to 13 gauge. It is easily and quickly set up and tooling is relatively inexpensive.

Ask for typical costs and Suggested tooling without obligation!

DAYTON ROGERS *Manufacturing Company*

[illegible] MINNEAPOLIS 7, MINNESOTA

New Truck Engine for GM

High compression truck engine with the best power-to-weight ratio ever achieved by General Motors Corp. is announced by R. M. Kyes, vice president and general manager, Truck & Coach Division. Compression ratio for the new 302-cu in. engine is 7.2 to 1. It generates 145 gross brake-horsepower at 3600 rpm.

Engine will power the company's 2½ and 3-ton trucks and tractors, replacing the old 270-cu in. model. High compression ratio is gained through built-in or mechanical octanes. Detonation or spark-knock tendencies have been reduced sufficiently to gain full power with regular gasoline.

Cylinder block and crankcase are cast as a unit to form stronger support for the engine; upper crankcase is heavily ribbed. Crankshaft is heat-treated, stress-relieved and Tocco hardened.

Relatively short crankpin stroke and resulting short throw make possible an appreciable overlap between main bearing journals and connecting rod throws, contributing to torsional rigidity. Torsional vibration damper also aids by adsorbing vibration impulses.

New M-400 Moraine bearings are estimated to have six to ten times longer life than conventional babbitt bearings and four to six times more load-carrying capacity. These are installed at crankshaft main journals and connecting rod lower ends.

Molds Made in Minutes

Complex molds made in minutes and finished mold sprayed in 28 minutes are experiences of plastics manufacturers who have tried a new development in the field of metal spraying.

In operation, the master is sprayed with a layer of low melting-point metal alloy, to a thickness of about 0.040-inch. Then a layer of an aluminum bronze alloy is applied to a thickness of 0.030-inch for additional strength and to

STANDARDS and SPECIALS by the Millions

THE FERRY CAP & SET SCREW CO.

2159 SCRANTON ROAD • • • CLEVELAND 13, OHIO

"SHINYHEADS"

America's Best Looking Cap Screw

Made of high carbon steel — AISI C-1038 — to standards for Full Finished hexagon head cap screws — bright finish. Heads machined top and bottom. Hexagon faces clean cut, smooth and true, mirror finish. Tensile strength 95,000-110,000 p.s.i. Carried in stock.

"HI-CARBS"

Heat Treated Black Satin Finish

Made of high carbon steel — AISI C-1038. Furnished with black satin finish due to double heat treatment. Hexagon heads die made, not machined. Points machine turned; flat and chamfered. Tensile strength 130,000-160,000 p.s.i. Carried in stock.

"LO-CARBS"

Made of AISI C-1018 steel — bright finish. For use where heat treatment is not required and where ordinary hexagon heads are satisfactory. Hexagon heads die made to size — not machined. Points machine turned. Tensile strength 75,000-95,000 p.s.i. Carried in stock.

SET SCREWS

Square head and headless — cup point. Case hardened. Expertly made by the pioneers in producing Cup Point Set Screws by the cold upset process. Cup points machine turned. Carried in stock.

FILLISTER CAP SCREWS

Heads completely machined top and bottom. Milled slots — less burrs. Flat and chamfered machined point. Carried in stock.

FLAT HEAD CAP SCREWS

Heads completely machined top and bottom. Milled slots — less burrs. Flat and chamfered machined point. Carried in stock.

"SHINYLAND" STUDS

All studs made steam-tight on tap end unless otherwise specified, with flat and chamfered machined point. Nut end, oval point. Land between threads shiny, bright, mirror finish. Carried in stock.

ADJUSTING SCREWS

Valve tappet adjusting screws — Hexagon head style — to blue print specifications — hexagon head hard; polished if specified — threads soft to close tolerance — points machine turned; flat and chamfered.

CONNECTING ROD BOLTS

Made of alloy steel — heat treated — threads rolled or cut — finished to extremely close thread and body tolerances — body ground where specified. Expertly made by the pioneers in producing connecting rod bolts by the cold upset process.

SPRING BOLTS

Case hardened to proper depth and ground to close tolerances. Thread end annealed. Supplied in various head shapes, with oil holes and grooves of different kinds, and flats accurately milled.

FERRY PATENTED ACORN NUTS

For ornamental purposes. Steel insert — steel covered. Finish: plain, zinc plated, cadmium plated. Size: 9/16", 3/4", 15/16" across the flats.

Tapped 1/4" to 3/4" inclusive. Cross section of Ferry patented acorn nut, showing how steel hexagon nut fits snugly into shell.

Pioneers and Recognized Specialists, Cold Upset Screw Products since 1907

STANDARDS carried by LEADING DISTRIBUTORS

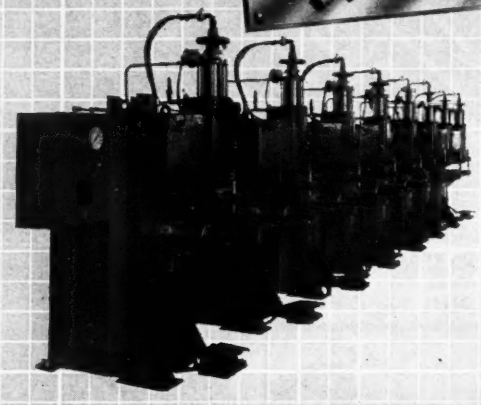
*

SPECIALS furnished to BLUE PRINT SPECIFICATIONS

WRITE FOR INFORMATION

SEND FOR SAMPLES

STAINLESS EXPERTS CHOOSE Federal



SINGLE PHASE *for* PRODUCTION LINE WELDING . . .

If you're welding stainless steel or alloys such as Nimonic and want the lowest cost and most efficient methods possible, get the Federal story before you buy your first piece of equipment.

The welders pictured on this page are part of a shipment to a nationally known stainless steel fabricator* who has worked with Federal engineers in making exhaustive studies on the subject. The welders are of the Federal Press Type Single Phase design that have been in constant use by this company for many years.

One of the nation's largest builders of resistance welders of all types — single phase or three phase — Federal will help you get the exact welder you need to do the best job. Contact your nearest Federal representative or write direct.

*Name on request.

Federal® WELDERS

THE FEDERAL MACHINE & WELDER CO.

WARREN, OHIO

Warco® PRESSES

relieve internal stresses. This layer is then followed with another layer of the wire.

Very little heat is retained by the metal particles when they strike the master. This cuts down distortion. Another advantage is the detail that can be retained by this process. Finish of the mold cavity is dependent only on the finish of the master.

Index to Quality

U. S. Steel releases method for predicting hardening characteristics of steel

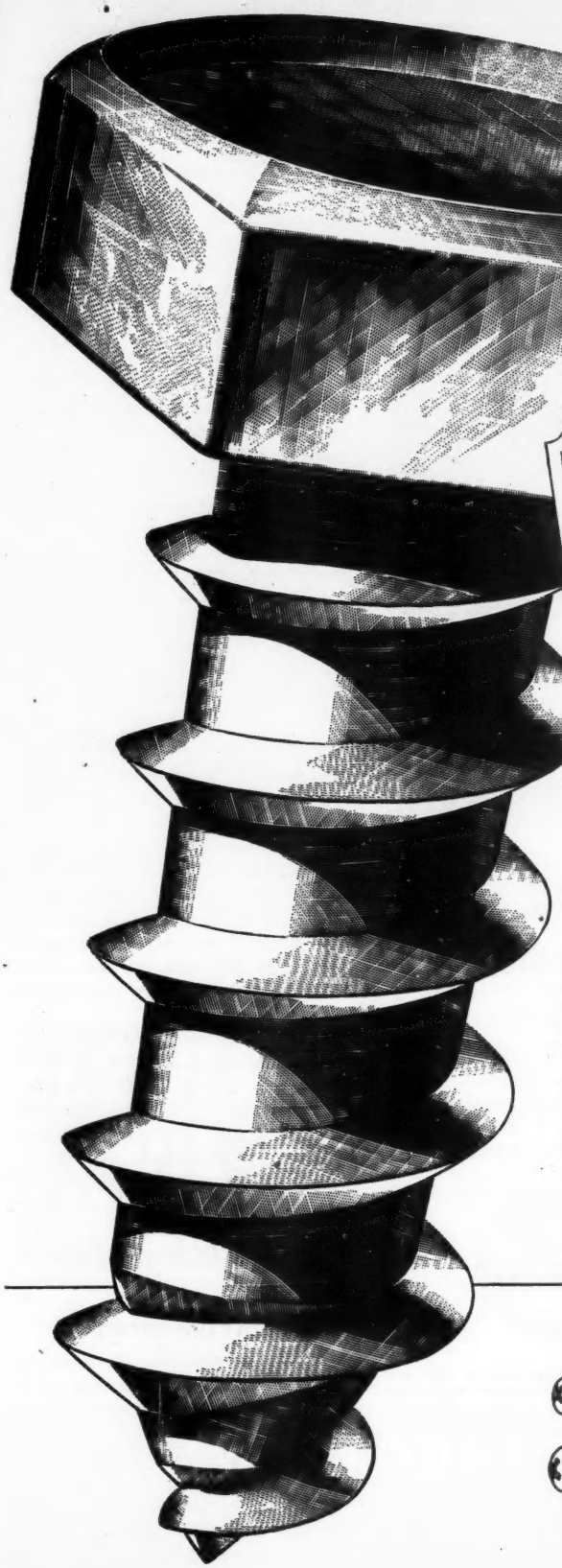
METHOD for predicting in advance the hardening characteristics of steel compositions is reported by U. S. Steel Co. Varying degrees of hardenability are indexes to the usefulness of steel for specific tasks. This knowledge will enable operating men to produce the types of steel that will exactly suit such diverse assignments as tough tank armor, strong struts for aircraft, brittle fragmentation bombs, or easily formable cases for shells.

Stretching Supply — Conversely, the patented method makes possible design of steels of required hardening characteristics from the available supply of steelmaking materials. Since many alloying elements normally used for special steels are now in short supply and others would be short if war blocked regular distribution, the new method should offer assistance in making maximum use of existing supplies of traditional elements. It could also aid in use of other elements that may be substituted to give approximately the same service.

Work on the process was directed by Dr. Marcus A. Grossmann.

Patent was assigned to U. S. Steel, where Dr. Grossmann is adviser in research planning. The company recently made its use available to all interested parties.

Definite Values — Hardenability of a steel, Dr. Grossmann asserts, is measured as the depth from the surface to which a given steel composition hardens when quenched. He adds that steel men have known for many years that hardenability in general depends on the chemical composition of a steel. By care-



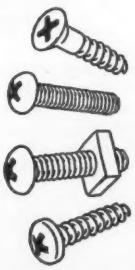
THIS IS AMERICAN

AMERICAN HEX-HEAD

Tapping Screws Take Greater Torque Load . . . *Speed Up Assembly*

This Type A Indented Hex-Head Tapping Screw is used *by the millions* in assembling radios, cameras, TV sets and other mass-marketed items. For in mass-production this type of fastener yields a special economy in the ease and speed with which it can be *wrench-driven* to required tightness.

So here you have still another type of fastener in the complete American line of screws and bolts with Phillips, slotted or special heads. And American's modern plant is geared to keep pace with the needs of any other mass-production industry. Write.



AMERICAN SCREW COMPANY

PHILLIPS HEADquarters
WILLIMANTIC, CONNECTICUT

Main Office & Plant
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Office & Warehouse, Chicago, Ill.

Demonstrates strapping unit loads to cut unit costs

LIKE other Brainard Strapping System salesmen, Paul Frank of St. Louis *sells with service.*

Here Paul demonstrates the proper use of Brainard steel strapping and strapping tools to secure four separate crates into a unit pallet pack. Such palletized loads expedite materials handling before shipment, in transit, and at the receiving end.

Use the experience of Paul Frank and his fellow Brainard salesmen. They are qualified to study your packaging and handling operations, then recommend *and demonstrate* the most efficient strapping system for you. And . . . you'll find them fast on their feet when you need service.

You'll get this superior service from Brainard salesmen located throughout the U. S.; in Canada, P. J. McArthur Co., Toronto.

COMPLETE STEEL STRAPPING SERVICE, LIGHT AND HEAVY DUTY STRAPPING, TOOLS AND ACCESSORIES

Brainard

SHARONSTEEL

STEEL DIVISION

SHARON STEEL CORPORATION

For new catalog on Brainard Strapping System write Brainard Steel Division, Dept. N-5, Griswold St., Warren, Ohio.

WARREN, OHIO

ful experiments and tests of results, Dr. Grossmann assigned definite hardenability values to these elements. Now, actual operations have established the validity of his findings.

"In the past," Dr. Grossmann said, "we knew roughly which alloying elements improved the hardenability of steels. Now by multiplying hardening factors, we arrive at a closer approximation. This knowledge helps to rationalize and inject order in our metallurgical planning."

Accurate Listing—The research specialist believes the most important use of the patent is in conserving scarce alloying materials. "In one column" he says, " we can set down the hardenability needed for a given job, as in defense production. In a parallel column we list the quantities of alloying elements we have to work with. With this information and the new data we can then design steels of required hardenability from our available materials."

New Use for Copper Cladding

Another application is announced for the copper cladding process.

American Cladmetals Co., Pittsburgh, reports it is cladding copper on steel to make a metal composite called Duraclad. Claims for the product indicate a savings of about 80 per cent on the copper usually required for downspouts in new homes.

Process provides the copper exteriors in demand for many building uses. It retains cladding characteristics of greater strength through steel sandwiched between two layers of copper. Material is ductile and easily worked. The company says other hardware items can be made with the process where solid brass is customarily used.

Valve Drive Line Introduced

Complete new line of automatic gate valve drives is announced by Janette Electric Mfg. Co., Morton Grove, Ill.

Drives are especially designed for use in connection with gate or angle valves in pipelines carrying intense pressure. Regular line of the motors ranging from 1/3 to 10

LEWIS FOIL MILLS

For the final, exacting reductions of aluminum, Lewis Foil Mills are proving their value in many mills. These new high-speed mills "roll it out" at 4000 feet per minute with extreme accuracy and non-stop performance. Why not take advantage of the valuable technical experience available at Lewis for rolling all types of ferrous and non-ferrous metals?

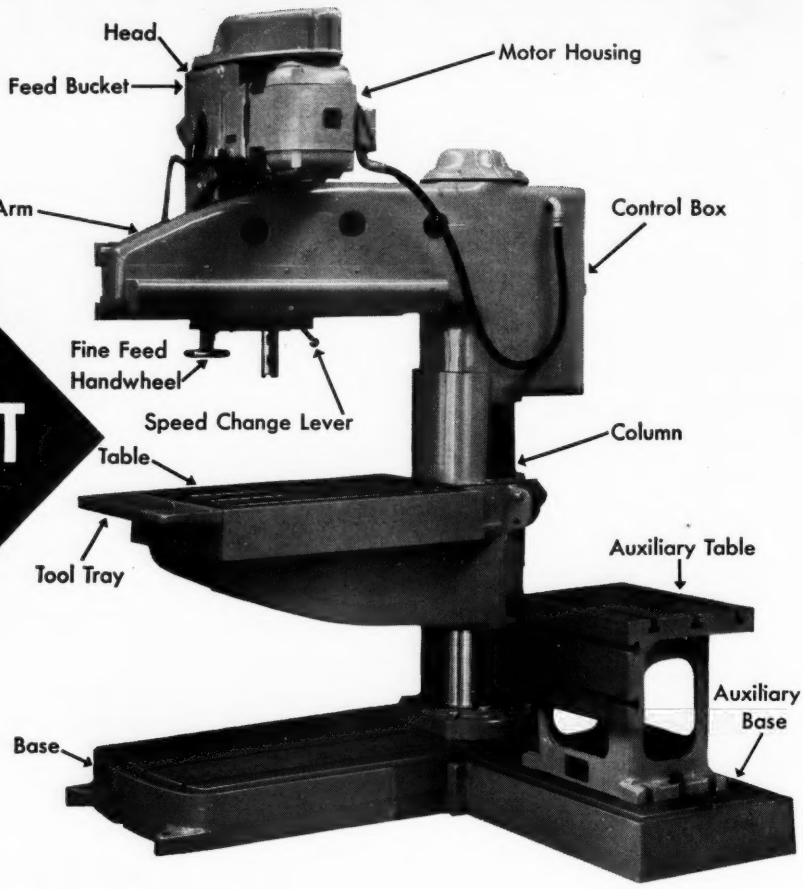
LEWIS FOUNDRY & MACHINE

DIVISION OF BLAW-KNOX COMPANY
PITTSBURGH, PA.

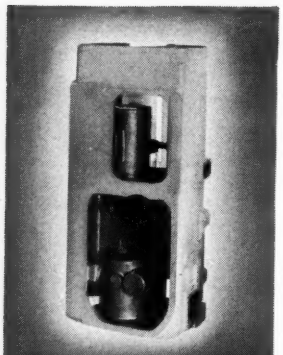
MANUFACTURERS OF ROLLS AND ROLLING MILL EQUIPMENT FOR THE IRON, STEEL AND NON-FERROUS INDUSTRIES

THERE'S ONLY

ONE RIGHT WAY...



specify GRAY IRON castings!



This head casting is typical of the intricately shaped, rigid members that give the perfect life-long alignment essential in machine tool operation.

20 PARTS OF THIS RADIAL DRILL ARE GRAY IRON CASTINGS (13 are visible in this photo) because by using gray iron this manufacturer has achieved rigid, durable construction obtainable with no other metal.

WHETHER A PART OR ASSEMBLY is plain or intricate—if it calls for vibration absorption, strength and wear resistance at low cost—you can't afford to overlook the advantages of gray iron castings. Gray iron offers an unmatched combination of characteristics to meet today's design problems.

GRAY IRON CHARACTERISTICS INCLUDE: Castability • Rigidity • Low Notch Sensitivity • Wear Resistance • Heat Resistance • Corrosion Resistance • Durability • Vibration Absorption • Machinability • Wide Strength Range.

Make it better with Gray Iron

SCRAP IS NEEDED FOR DEFENSE—KEEP IT MOVING!

GRAY IRON FOUNDERS' SOCIETY, INC.

NATIONAL CITY-E. 6th BLDG., CLEVELAND 14, OHIO

horsepower will be produced. There will also be a special line ranging up to 50 hp.

Longer Life for Flow Valves

Valve balls and seats in oil well gas lift flow valves have to resist salt water corrosion and abrasive-laden, high velocity and high pressure gases. These gases vary from 400 to 1000 psi depending on depth of the well.

Selection of a material that will stand up under such severe wear conditions is a problem solved recently by two gas lift valve manufacturers. Each specified and standardized on Carboloy cemented tungsten carbide for the valve ball and seat material.

These manufacturers tested various types of corrosion resistant valve materials in actual continuous flow operation. The Carboloy tungsten carbide valve balls and seats, inspected after periods up to one year, show no measurable wear. They maintained consistent performance.

One well in which a valve was installed for nine months was 3600 feet deep and produced 450 barrels of oil a day at 450 psi pressure. The fluid in contact with the valve parts was 90 per cent salt water with a considerable amount of sand.

Bushing Reduces Breakage

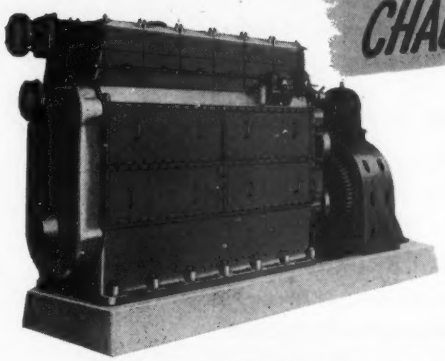
Porcelain breakage may be reduced by simplified construction in a high-voltage transformer bushing announced by General Electric Co.'s Power Transformer Department. Possibility of breakage is lessened by pressure clamping, a feature that replaces the cemented clamping rings used previously.

Reduced in size and weight, the new model will cut transformer height 1-5 inches. It is liquid filled and completely sealed to prevent internal corona discharges under high pressure. Bushing has a resin-impregnated paper core. Installation of the type LC will be made in large power transformers of the 15 and 25-kv classes; in all power and distribution transformers of the 34½, 46 and 69-kv classes; and in oil circuit breakers of 25 and 46-kv classes. Application of the same support-flange dimen-

Security Studloc

LOCK IT
where you want it!

CHALLENGE US!



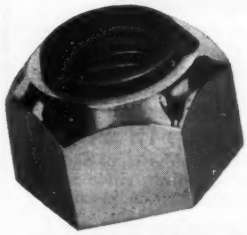
Chicago Pneumatic Tool Company amongst other things builds Diesel Engines. Holding the adjustment against the vibration present on the valve tappet adjusting screws was a problem. Security Studlocs have been in service on Chicago Pneumatic valve tappet adjusting screws for some time and have proved their dependability for holding the adjustment setting.

SECURITY has solved the problem of keeping adjusting screws, bolts and studs *where you want them!*

The Security Studloc can be adapted to provide a positive lock in counterbores and housings or it can be keyed into work to serve as a simple lock nut.

The Security Studloc will hold its position on a bolt, adjusting screw or stud in the face of vibration that will destroy the bolt. It can be readjusted, removed and replaced any number of times without distorting or damaging the bolt and without materially reducing its holding power. All load is carried by the threads of the tapped hole not by the Studloc.

The Security Studloc is a simple, elliptical, heat treated, spring retainer of the highest quality spring steel possible to obtain. Forcing it into "round" creates a gripping power that defies any attempt to move it except by design. An ear on one side permits keying the Studloc into the plate, base or housing.



Here is the Security Locknut! It provides an unequalled answer to general fastener problems. Grueling tests by unimpeachable sources have demonstrated that Security Locknuts retain their position regardless of vibration that would destroy the bolt. Security Locknuts can be removed and re-used any number of times. If you have a fastener problem specify "Security".

Security Studlocs are serving in locking tappet adjusting screws, cylinder head studs, engine through bolts, flange screws and in solving other difficult problems where bolts or studs must be kept tight. They are available in bolt sizes ⅜ in. to 3 in.

If you have a fastener problem challenge us to solve it! Send the coupon.

SPECIAL OFFER—Ask for a Security Thread Tolerance Chart. Spin the dial and you have your thread tolerance figures.

Security
The Nut You Can't Shake Loose

SECURITY LOCKNUT CORPORATION
North Ave. and 15th Ave., Melrose Park, Ill.
Please send me without obligation:
☐ One of your Thread Tolerance Charts.
☐ We have a fastener problem and would like to know more about Security Locknuts.

Company Name _____
Address _____
Town _____ Zone ____ State _____
Signed _____

ALUMINUM EXTRUSIONS

fast deliveries

on A, B, C and E Allotments

Any shape that can be contained in a 6 inch circle. Any length up to 40 feet. Send drawings, specifications and data.

Fabrication facilities available!

We are equipped for aluminum fabrication from extrusion to finished product.

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25 YEARS OF LEADERSHIP IN FASTENINGS OF STAINLESS STEEL
To YOU, Anti-Corrosive's 25th Anniversary is an assurance that the oldest, largest and best known firm dealing exclusively in stainless steel fastenings is best suited to serve your needs in this field.
Still Plenty of Fastenings IN STOCK
For quick delivery of stainless steel fastenings, check Anti-Corrosive first, since many stock items and alternates are on hand!
FREE - A - N Fastening Selector !
Write for handy slide Chart No. 52S — instantly identifies A-N Nos. pertaining to stainless fastenings, gives sizes, other data. Catalog available.
1927 - 1952
Anti-Corrosive
Metal Products Co., Inc.
Manufacturers of STAINLESS STEEL FASTENINGS
CASTLETON ON HUDSON, NEW YORK

sions that were specified for older type equipment permits its use for replacement.

Mats Take Chill Off Job

Crane and coal mine locomotive operators soon may be supplied with foot warmers. A rubber mat with a built-in radiant heating unit has been developed by the mechanical goods division, United States Rubber Co., New York.

On the surface, the heater looks like a rubber floor mat. Its center, however, contains a layer of electrically conductive rubber which constitutes the heating element. It operates on 110-v current which can be supplied from any lamp socket or baseboard outlet.

New mat has been tested in warehouses, police booths and toll booths. It also was tried in unheated or refrigerated areas of industrial plants to provide greater comfort for employees who encounter cold working conditions on the job.

Mine Comfy—A coal mine operator installed the heaters in the mine locomotives to warm the feet and legs of the operators. Two units were used, one on the cab floor and another softer type on the back of the seat. They are also used in cabs of overhead cranes and under the feet of machine operators who must stand in cold areas for long periods of time.

Normal operating temperature for the heater is about 35 degrees above surrounding temperature. This temperature is warm enough to give adequate comfort but not hot enough to feel uncomfortable.

Uses Expand for New Winding

Perfection of a new winding technique for its Thermalastic insulation permits Westinghouse Electric Corp. to expand uses for the product. The company reports applications are being made on waterwheel generators, synchronous condensers and frequency changers rated 30,000 kva or above, employing 10 or more poles.

When the insulation was introduced two years ago, its use was restricted to turbine generators rated 12,500 kva and larger. Although it was easily applied to the half coils of these generators,

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HOUGHTON'S "LIQUID SALT BATHS"—a 32-page book covering general heat treating applications for salts—frankly tries to "sell" you on using them more widely.

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CITY ZONE STATE

a different technique was required for multi-turn full coils. More than 4 million kw of turbine generators with this new stator winding have been shipped.

Splicer Works Without Cement

Development of an electric automatic splicer designed to splice 16, 35 and 70-mm magnetic, roll or x-ray film is announced by Prestoseal Mfg. Co., Long Island City, N. Y. Machine is said to be effective without scraping or use of cement, achieving a splice that will hold up even under a hot development process.

Modified model can be used for microfilm splicing without losing document area on either negative or positive stock. Interchangeable heads make the unit adaptable for both 35 and 16 mm in about 30 seconds, without use of tools. Splicer operates on a principle of controlled heat and pressure, applied in precise, automatically controlled time cycles. Splice itself adds no thickness to the film.

Good for many years at hard labor

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Special machinery is created in our shops from your own design . . . or we will design and fabricate to solve your specific problem.

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951 Penn Avenue, Pittsburgh 22, Pa.

Packaging Road Demonstrated

Requests for demonstrations have led Reynolds Metals Co., Louisville, to add a second mobile unit for demonstrating military packaging. Purpose of the two traveling workshops is to encourage industry to bid on military packaging contracts.

Both units are housed in 30-foot, all-aluminum semi-trailers that carry their own electric power plants and heating and ventilating systems. Additional equipment includes wax and plastic dip pots, band and jaw-type heat sealers, vacuum pumps, air compressors and a complete stock of qualified aluminum foil barrier materials.

Complete facilities and a trained crew carry through actual demonstrations of foil packaging methods approved by the various branches of the armed forces.

Testing Austenitic Stainless

Nickel in combination with chromium increases corrosion resistance in both oxidizing and reducing solutions. In addition, it has desirable effects in promoting austenitic structure and maintaining it during and after fabrication. These general conclusions are the result of tests on several austenitic stainless steels in various acid, neutral and alkaline solutions reported in a 32-page booklet published by International Nickel Co. Inc., New York. The publication covers corrosion resistance mechanism; factors affecting stainless corrosion; behavior of stainless in various corrosive environments; and preferred practice in stainless construction and use.

Die Block Line Outlined

Enlarged edition of its die block handbook is announced by Heppenstall Co., Pittsburgh. The 80-page booklet describes eight types of the company's die steels, recommending application and giving detailed instructions for heat treatment.

Other products described include sow blocks, hammer rams, piston rods and heads, trimmer steels, and crank and eccentric shafts for forging machines. Products are illustrated and diagrammed to gain clarity.

Among the tables employed are those covering comparative

From deep inside a mountain—
GOOD NEWS FOR ALUMINUM USERS

The availability of aluminum will be increased materially by new production facilities already well into construction at Kitimat, in the mountain wilds of British Columbia. There Aluminum Company of Canada, Ltd. ("Alcan"), whose products we distribute, is building a new plant, which in its initial phase will provide 200 million pounds more aluminum per year.

Abundant low-cost power is needed to produce aluminum economically. To serve Kitimat, a great hydroelectric plant will be installed inside a mountain. Water will travel through ten-mile tunnels, such as the one shown above, and drop half a mile to the power house, located inside a cavern.

Meanwhile, from existing facilities, millions of pounds of Alcan aluminum are helping to keep over a million metal-workers busy in American foundries and fabricating plants, turning out thousands of lightweight, long-lasting aluminum products for defense, industry, farm, and home.

ALUMINUM IMPORT CORPORATION

Distributing company, in the Western Hemisphere, of the **ALUMINIUM LIMITED** *group*

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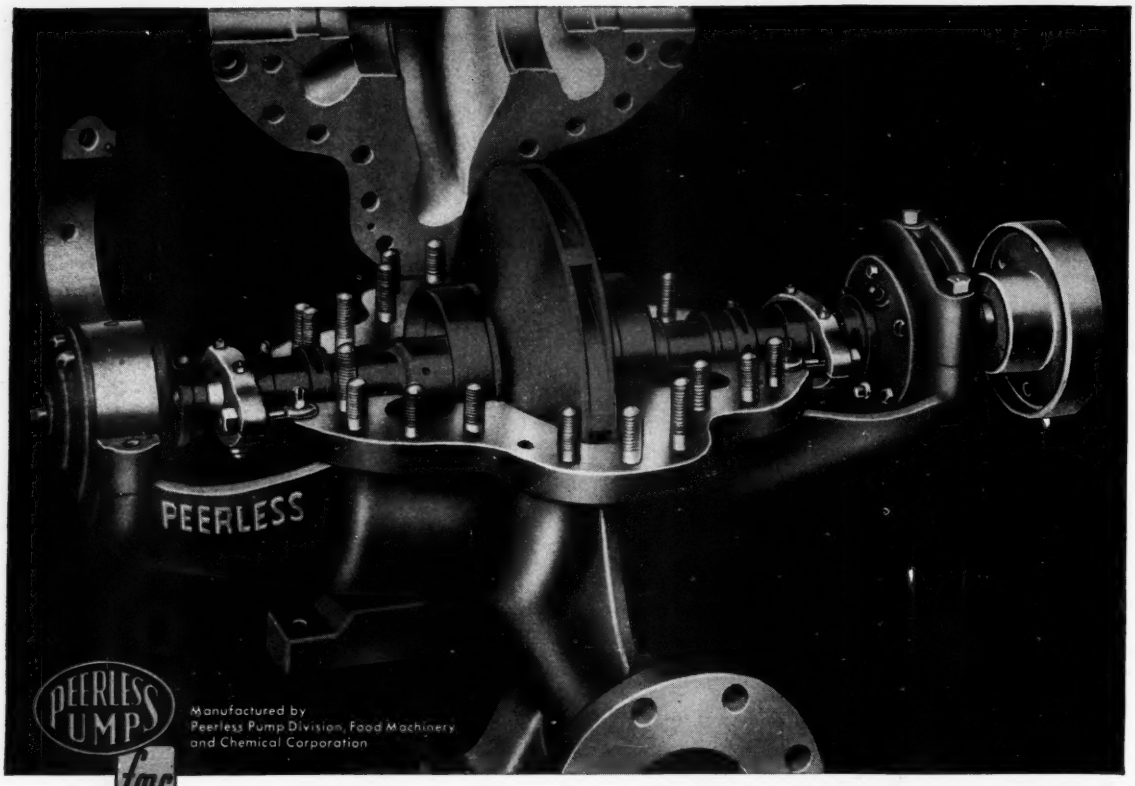

When fire strikes IT PUMPS PROTECTION

This is the heart of reliable systems that protect against hazards of fire

America's annual loss to the ravages of fire is a staggering amount. Reliable plant and property protection often begins with an independent fire protection system, the heart of which is an approved and reliable fire pump. In the manufacture of fire pumps, rigid construction requirements and operational dependability are paramount. This is why National Bearing Division was selected to supply bronze impellers, wearing rings, and shaft sleeves, for this fire pump and other pumps bearing the Peerless name.

In supplying component fire pump parts to Peerless, a supplier must not only meet the rigid requirements of this manufacturer, but also the strict regulations of Underwriters' Laboratories, Inc.; National Board of Fire Underwriters, Chicago; and the Inspection Department, Associated Factory Mutual Fire Insurance Companies, Boston.

National Bearing's proved ability to mass produce exceptionally fine-grained, non-ferrous castings, free from blow holes and sand inclusions, combined with Peerless Pump Division's exacting engineering and manufacturing standards help build fire pumps, and industrial pumps that can be counted to pump a reliable water supply for fire protection or other plant needs.

If your product requires non-ferrous castings or bearings, National Bearing Division has the foundry facilities, experience and skill that will insure better product performance and may possibly lower product costs.

AMERICAN Brake Shoe COMPANY

NATIONAL BEARING DIVISION

4925 Manchester Avenue • St. Louis 10, Mo.

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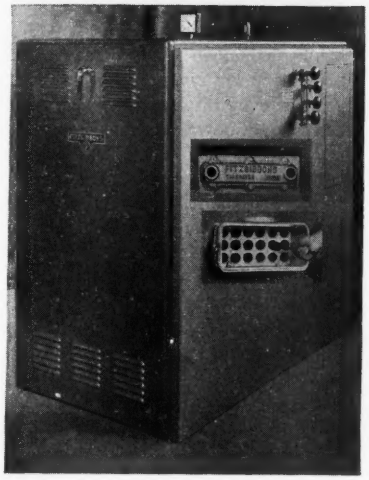
FITZGIBBONS BOILER KNOWS Do You?



FITZGIBBONS BOILER CO., pacemaker in the heating equipment industry, thoroughly knows the value of production techniques that save installation time and result in better products. It's no surprise, then, that when it comes to fasteners, Fitzgibbons is fully acquainted with Stud Welding, the modern fastening method.

One of the numerous products in which Fitzgibbons employs KSM Solid-Fluxed Studs to advantage is the domestic hot water heater pictured above.

Have you looked into Stud Welding for **your** important fastening jobs? It's a thoroughly modern method that saves important man hours in installation. And when the installation is completed, the resulting weld makes a fastener that is strong and permanent in a manner that no other type of fastener can duplicate. For more information write for Bulletin 1002. KSM PRODUCTS, INC., MERCHANTVILLE, N. J.

KSM PRODUCTS INC. ®

ARC WELDING STUDS

hardness, draft angles for die blocks, decimal equivalents of fractions, a temperature conversion chart, shrink chart and weights of various steel bar shapes.

Steel Capacity Added

More than $2½ million worth of General Electric equipment, including drives totaling 14,300 horsepower, is being installed as part of a new five-stand tandem cold-strip steel mill at the Kaiser Steel Corp.'s Fontana, Calif., plant. This increased capacity is intended to help meet the increasing demands of the booming California canning industry.

With a rated top speed of 1100 feet per minute, it will cold-roll tinplate up to 38 inches wide. Five motors, ranging in size from 1500 to 3500 hp, will drive the five stands of the mill and the reel will be driven by an 800-hp motor. Electric power for the various motors will be furnished by two motor-generator sets with ratings of 5600 and 5840 kw respectively.

Faster Service on Plate Stock

Additional equipment leads to faster service on sheared and flame-cut steel plates from stock at the Seattle steel plant of Joseph T. Ryerson & Son Inc. An electric eye flame cutting machine and a new plate shear turn the trick.

Sensitive flame cutting equipment employs the photo-electric tube to guide mechanized flame cutters. Tracer operates from a black and white outline drawing or silhouette and any pattern can be reproduced in steel, with square, sharp corners.

The new plate shear has a capacity of ¾-inch by 8 feet.

Embossing Press Line Imported

Transmares Corp., New York, reports availability of a line of Schuler knuckle joint embossing presses, imported from L. Schuler A.G., Goeppingen, W. Germany. Presses have pressure ratings of 100, 250, 650 and 1000 tons. Lighter models are built with one-piece cast steel frames; largest has a built-up frame with four shrunkin steel tie bars.

All units have multi-disk friction clutch and brake, hydro-pneu-

TAGLINE CONTROL

HERE'S WHY:

You get *more work* out of a bucket that holds steady and is back in position *quicker* for another bite. Rud-O-Matic Taglines have ample coil spring power to provide constant tension for steadying the largest clamshell buckets at any angle of the boom.

You get *lower costs* through faster operation coupled with Rud-O-Matic's trouble-free service. No pins, weights or tracks to get out of whack, only the simplest of working parts. Compact — and easy to install on any crane.

Rud-O-Matic Taglines are made in 8 models for all bucket sizes, and are supplied with cable and installation equipment. *Immediate delivery from your nearby equipment dealer — or send coupon below for details.*

I'd like more information on Rud-O-Matic Taglines. Send literature and complete details.

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The Only AIR CYLINDERS With All Controls Built In

HERE are Air Cylinders so different in design that they have become known as the Bellows Air Motors. They are not rotary motors but double-acting, reciprocating, cylinder-type power units. Four-way directional valves and separate speed control valves for advance and retract strokes are built in. Only one air connection is needed, which can be flexible hose.

In manually controlled models (BM Series) the directional valve is operated by a lever adjustable to work from practically any angle in any plane. It may be operated by hand, linked to a foot pedal, or mechanically synchronized to a moving machine element.

In electrically controlled models (BEM Series) the Air Motor is equipped with the built-in Bellows Electroaire Valve, actuated by low voltage solenoids. The Electroaire Valve will operate at high speeds all day without discernible hum, pounding or overheating. In fact, the solenoids are guaranteed against burnout.

Bellows Air Motors are made in bores of 1¼", 1¾", 2½", 3⅝" and 4½", in any stroke length.

Write for New Bulletin — *Complete descriptions of Bellows Air Motors and other Bellows "Controlled-Air-Power" Devices: technical data, wiring diagrams, dimensions, application detail, etc. Ask for Bulletin CL-30. Address: The Bellows Co., Dept. ST 552, 222 West Market Street, Akron 9, Ohio.*

1207

HYDRAULIC CHECKING OF AIR POWER

The Bellows Hydro-Check removes the natural "bounce" and "springiness" from air—gives the smoothness of hydraulic operation to air-powered equipment—but keeps the speed, flexibility and economy of air-operation. The Hydro-Check is available for use with all Bellows "Controlled-Air-Power" Devices or may be installed to regulate and control the piston movement of standard Air Cylinders.

The Bellows Co.
AKRON 9, OHIO
FIELD ENGINEER OFFICES IN ALL PRINCIPAL CITIES

matic clamping and electro-pneumatic control. Design provides for controlled ejectors in slide and bed.

Turbines Bid for Pumping Work

Gas turbines should provide the cheapest and most efficient source of power for gas pipeline pumping. This was the claim made by J. O. Stephens, development engineer for Westinghouse Electric Corp.'s Steam Turbine Division when he addressed members of the Natural Gas Association at its spring meeting in Los Angeles.

The engineer gave force to his prediction by citing a recent company survey in which two gas pipelines, one powered by reciprocating engines and the other by gas turbines, were studied and operations compared. Results show a 26-inch pipeline powered by gas turbines delivered the same amount of gas more economically than a 30-inch line powered by reciprocating engines. In addition, he said, the turbine-powered line required about $8 million less capital investment and 64,500 fewer tons of steel to build. Annual cost was reduced by about $1,360,000 or 0.8 cents per 1000 cu ft of gas pumped.

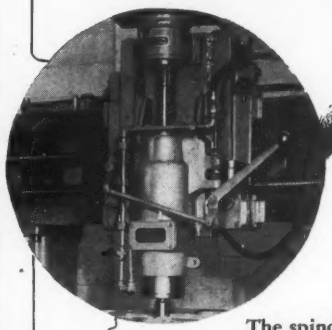
Mr. Stephens reports the gas turbine lends itself particularly to driving a high speed centrifugal compressor for gas compression. He asserts that the centrifugal compressor operates more efficiently at lower pressures than a reciprocating type, permitting closer station spacings. When intermediate turbine stations are added to a line already powered by reciprocating engines, capacity can be increased economically.

First experimental Westinghouse gas turbine built for land application was installed in 1949 at Wilmar, Ark., on Mississippi River Fuel Corp.'s line. This engine was purchased by the fuel company and is now in permanent operation.

Jigs, Fixtures Cataloged

Comparison chart covering products made by five jig and fixture components manufacturers is offered by Northwestern Tool & Engineering Co., Dayton, O. Chart includes comparative catalog numbers of 11 types and 71 sizes.

How "ABUSE CAPACITY" is built into a 12 speed spindle



The spindle of Pratt & Whitney's 40" Vertical Profiler and Miller is designed for 12 operating speed ranges from 260 to 6200 r.p.m. Machine operations may be confined to continuous production at any one speed for extended periods. The diversification of operating conditions represented puts an extremely heavy burden on spindle bearings.

"Abuse capacity" is provided by the aristocrats of all bearings . . . Fafnir Super-Precision ball bearings. Four pairs support the main spindle and drive shaft. Notice how they are arranged in the cross section diagram. This set-up not only assures positive axial and radial rigidity, but also provides for shaft expansion. The bearings run cool under varying conditions of load and speed . . . conserve power . . . need no adjustment . . . and are permanently grease packed.

Whatever your bearing problem, a few minutes spent with a Fafnir representative may help you solve it as successfully. The Fafnir Bearing Company, New Britain, Conn.

Bearings used
Fafnir Super-Precision Ball Bearings made to extremely close tolerances, assuring accuracy and smoothness of operation . . . counterbore construction with shallow shoulder on one side . . . one-piece, composition retainers.

FAFNIR
BALL BEARINGS

MOST COMPLETE LINE IN AMERICA

CALENDAR OF MEETINGS

May 25-28, National Association of Purchasing Agents: Annual international convention & exposition, Convention Hall, Atlantic City, N. J. Association address: 11 Park Place, New York 7. Executive secretary: George Renard.

June 1-6, Society of Automotive Engineers: Summer meeting, Ambassador & Ritz-Carlton Hotels, Atlantic City, N. J. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

June 2-3, Multiple V-Belt Drive & Mechanical Power Transmission Association: Spring meeting. Edgewater Beach Hotel, Chicago. Association address: 7 W. Madison St., Chicago 2. Secretary: Harry P. Dolan.

June 2-4, American Gear Manufacturers Association: Annual meeting, The Homestead, Hot Springs, Va. Association address: 302 Empire Bldg., Pittsburgh 22. Executive secretary: John C. Sears.

June 2-13, Canadian International Trade Fair, Exhibition Grounds, Toronto.

June 3-6, National District Heating Association: Annual meeting, Skytop Lodge, Skytop, Pa. Association address: 827 N. Euclid Ave., Pittsburgh 6. Secretary-treasurer: John F. Collins.

June 5-7, Electric Metal Makers Guild Inc.: Annual meeting, French Lick Springs Hotel, French Lick, Ind. Guild address: Box 6026, Mt. Washington Station, Pittsburgh. Secretary: C. B. Williams.

June 9-21, International Organization for Standardization: Triennial meeting, Columbia University, New York. Secretary-general: Henri St. Leger, Geneva, Switzerland. Host association: American Standards Association, 70 E. 45th St., New York 17. Secretary: George F. Hussey Jr.

June 13, The Wire Association: Regional meeting, Hotel Biltmore, Los Angeles. Association address: 453 Main St., Stamford, Conn. Executive secretary: Richard E. Brown.

June 15-18, National Association of Cost Accountants: Annual international cost conference. Waldorf-Astoria Hotel, New York. Association address: 505 Park Ave., New York 22. Secretary: A. B. Gunnarson.

June 15-19, American Society of Mechanical Engineers: Semi-annual meeting, Sheraton-Gibson Hotel, Cincinnati. Society address: 29 W. 39th St., New York 18. Secretary: C. E. Davies.

June 16-17, Malleable Founders Society: Annual meeting, The Homestead, Hot Springs, Va. Society address: 1800 Union Commerce Bldg., Cleveland. Secretary: Lowell D. Ryan.

June 16-20, American Electroplaters Society: Annual meeting and industrial finishing exposition, Hotel Conrad Hilton and International Amphitheatre, Chicago. Society address: Box 168, Jenkintown, Pa. Secretary: D. Gardner Foulke.

June 17-19, American Management Association: General conference, Waldorf-Astoria Hotel, New York. Association address: 330 W. 42nd St., New York.

June 22-24, Alloy Casting Institute: Annual meeting, The Homestead, Hot Springs, Va. Institute address: 32 Third Ave., Mineola, N. Y., Secretary: E. A. Schoefer.

June 23-26, Radio-Television Manufacturers Association: Annual convention, Palmer House, Chicago. Association address: 777 14th St. NW, Washington 5. Secretary: James D. Secrest.

June 23-27, American Institute of Electrical Engineers: Summer general meeting, Hotel Nicollet, Minneapolis. Institute address: 33 W. 39th St., New York 18. Secretary: H. H. Henline.

June 23-27, American Society for Testing Materials: 50th anniversary meeting and exhibit, Hotel Statler and New Yorker, New York. Society address: 1916 Race St., Philadelphia. Secretary: C. L. Warwick.

June 23-27, American Society of Mechanical Engineers: Oil & Gas Power Division conference, Hotel Statler, Buffalo, N. Y. Society address: 29 W. 39th St., New York 18. Secretary: C. E. Davies.

June 29-July 2, National Industrial Advertisers Association: Annual meeting, Palmer House, Chicago. Association address: 1776 Broadway, New York. Executive secretary: Blaine G. Wiley.

June 29-July 2, Caster & Floor Truck Manufacturers Association: Joint material handling, industrial meeting, Grand Hotel, Mackinac Island, Mich. Association address: 7 W. Madison St., Chicago 2. Secretary: Harry P. Dolan.

June 30-July 2, Materials Handling Institute: Annual meeting, Grand Hotel, Mackinac Island, Mich. Institute address: 731-732 DuPont Circle Bldg., Washington 6, Managing director: R. Kennedy Hanson.

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MEANS BETTER COLD-ROLL FORMING
ROLL FORMING MACHINES
PUNCH TYPE CUT-OFFS
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— for all makes of machines
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20700 St. Clair Avenue · Cleveland 17, Ohio

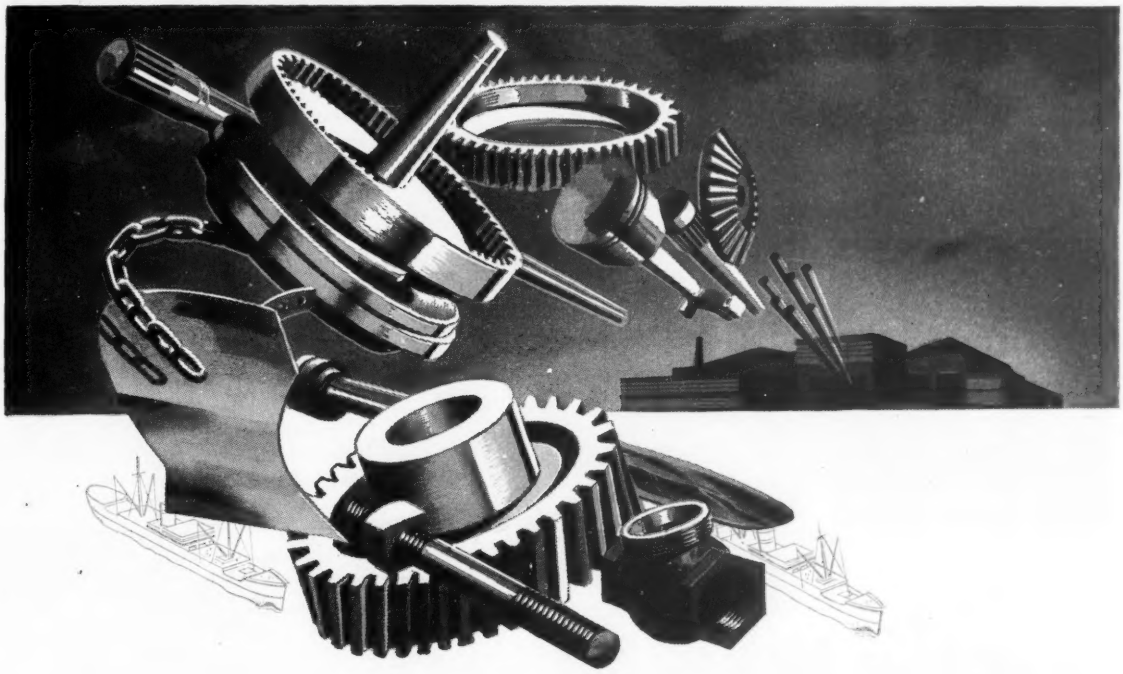
Shedding Light on the Lathe

More effective light from the slide of a lathe is achieved by Standard Oil Co. of Ohio. The company mounted an extension cord reel on the machine; this pays out or takes up cord as slide moves.

Result provides the operator with light over the tool at all times and frees his hands for the job. In this installation, a transformer provides 110-volt ac current.

Reels are made by Benjamin Reel Products Inc., Cleveland, and are available with transformer and adjustable light.

What's your rust prevention problem?



One of Gulf's Quality Rust Preventives can help you solve it

From the complete Gulf line of quality rust preventives, you can select the proper coatings to fit the desired methods of application, types of metal, length of time for which protection is required, conditions of storage or shipment, and ease of removal.

Gulf makes available both oil — and petrolatum-type rust preventives for both interior and exterior use — including the well-known Gulf No-Rust C (Polar Type), which displaces residual moisture on metal surfaces and lays down a protective coating; and Gulf No-Rust Engine Oils, which prevent corrosion caused by products of combustion left in internal combustion engines.

There's a Gulf rust preventive for every duty, for protection against all exposures. Send the coupon for copy of a pamphlet describing the principal rust preventives in the Gulf line. For effective help on your rust or corrosion problems, call in a Gulf Lubrication Engineer.

GULF SERVES INDUSTRY

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719 Gulf Building, Pittsburgh 30, Pa.

Please send me, without obligation, a copy of your pamphlet "Gulf Rust Preventives."

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- Brakes, Hand or Power
- "C" Clamps
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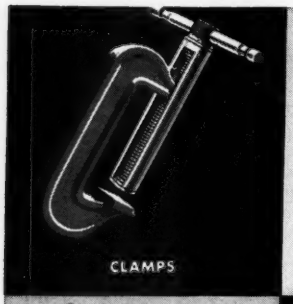
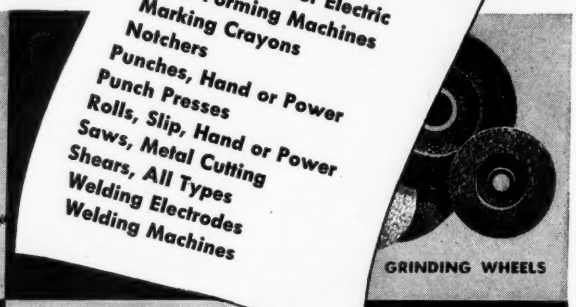
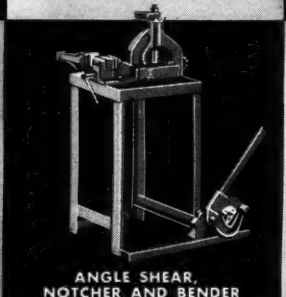
- Elbow Machines
- Expanded Metal
- Flanging Machines
- Galv-Weld
- Grinders, Portable Electric
- Grinding Wheels
- Hoists, Hand or Electric
- Lock Forming Machines
- Marking Crayons
- Notchers
- Punches, Hand or Power
- Punch Presses
- Rolls, Slip, Hand or Power
- Saws, Metal Cutting
- Shears, All Types
- Welding Electrodes
- Welding Machines


CLAMPS

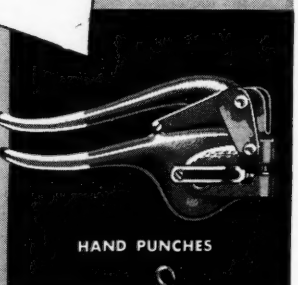
PORTABLE ELECTRIC SHEAR

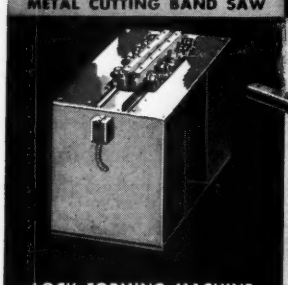

GRINDING WHEELS

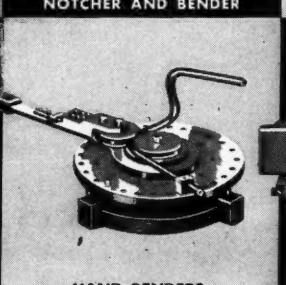
METAL CUTTING BAND SAW


ANGLE SHEAR, NOTCHER AND BENDER

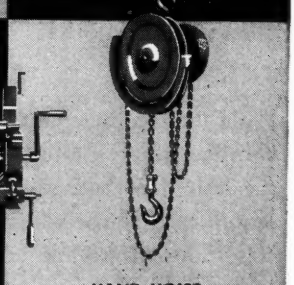
WELDING MACHINES


HAND PUNCHES


LOCK FORMING MACHINE


HAND BENDERS

SLIP ROLL


HAND HOIST

UNITED STATES STEEL SUPPLY DIVISION

UNITED STATES STEEL COMPANY

HEADQUARTERS: 208 So. LA SALLE ST., CHICAGO 4, ILL. WAREHOUSES COAST-TO-COAST

Warehouses and Sales Offices: BALTIMORE · BOSTON · CHICAGO · CLEVELAND · LOS ANGELES · MILWAUKEE · MOLINE, ILL. NEWARK · PITTSBURGH · PORTLAND, ORE. · ST. LOUIS · TWIN CITY (ST. PAUL) · SAN FRANCISCO · SEATTLE

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UNITED STATES STEEL

New Products and Equipment

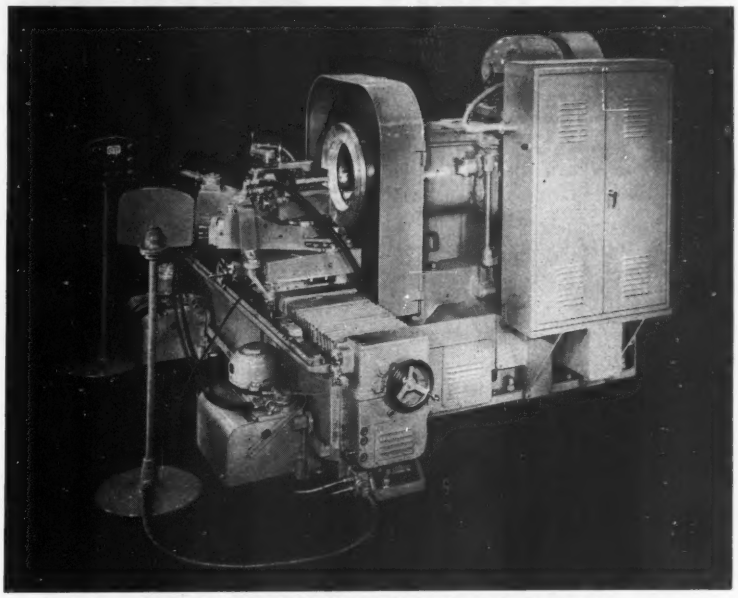
Lathe Turns, Bores Jet Parts

USE REPLY CARD—CIRCLE No. 1

Right angle lathe, the model O, made primarily for finish turning and boring jet engine rings, vanes and shrouds and other work of similar shape is a development of Monarch Machine Tool Co., Sidney, O. Machine employs the company's Air Gage Tracer to turn or bore any combination of straight sections and continuously varying contours to a high degree of finish and at minimum cost. The tool has two slides, one for turning, the other for boring. One slide is always tracer controlled, but both can be controlled, making it possible to produce many workpieces complete at one chucking.

Headstock is a 16-speed helical geared type with individual motor drive through multiple v-belts. Regular 1800 rpm motor provides spindle speeds from 6 to 303 rpm. On special order, a 3 to 455-rpm range can be supplied. Spindle and long intermediate shaft have center bearing support; all bearings are antifriction type. A lever at the front of the headstock, used only during setup, provides a means for starting and stopping the spindle manually. Headstock position is adjustable through a handwheel over 12-inch travel. Either 40 or 52-inch face plate is available. Work up to 60 inches diameter can be swung in the gap.

The model F right angle lathe is a machine of similar design, introduced with model O and intended particularly for finish facing. Complete pushbutton control is an important feature of both machines. Both have fully automatic turning cycle, infinitely variable longitudinal and angular crossfeeds.



RIGHT ANGLE LATHE WORKS RINGS, VANES AND SHROUDS
. . . employs the Air Gage Tracer to finish straight and varying contoured sections

Tester Checks Spring Loads

USE REPLY CARD—CIRCLE No. 2

Spring tester made by Carlson Co., 277 Broadway, New York 7, N. Y., is a precision instrument introduced to check loads and deflections of compression and extension springs. Production testing speed varies from 300 to 600 tests per hour. Production stops and tolerance markers are easily adjustable and accuracy is guaranteed to within ¼ of 1 per cent to meet National Bureau of Standards requirements. Dial indicator for reading deflections with extreme accuracy is available. In capacity, the tester takes loads to 300 pounds, spring diameters to 4 inches and length to 12 inches for compression, 10 inches, extension.

Mercury Detectors Redesigned

USE REPLY CARD—CIRCLE No. 3

Redesigned portable mercury-vapor detectors, made for indicating concentrations of mercury that could be harmful to workers, are announced by Special Products Division, General Electric Co., Schenectady 5, N. Y. Units are the type A (electronic) and the type B (chemical). Electronic instrument is designed to give instantaneous indication of mercury vapor by resonant absorption of ultraviolet energy. It gives immediate readings from 0.01 to 3.0 milligrams of mercury per cubic meter of air. Chemical detector is designed for continuous monitoring and indicates as little as 0.10 milligrams per cubic meter of air in two hours.

Unit Sets Time, Temperature

USE REPLY CARD—CIRCLE No. 4

Electronic circular chart controller that can control industrial processes according to time-temperature schedules is a development of Brown Instruments Division, Minneapolis-Honeywell Regulator Co., Philadelphia 44, Pa. To gain both time and temperature control, an integral-program cam mechanism automatically positions the instrument control point in accordance with a predetermined program.

Within a single case the instrument combines measurement and recording on a 12-inch chart; automatic positioning of the set point index; and automatic program control of the variable. The company's standard continuous balance sys-

REPLY CARDS

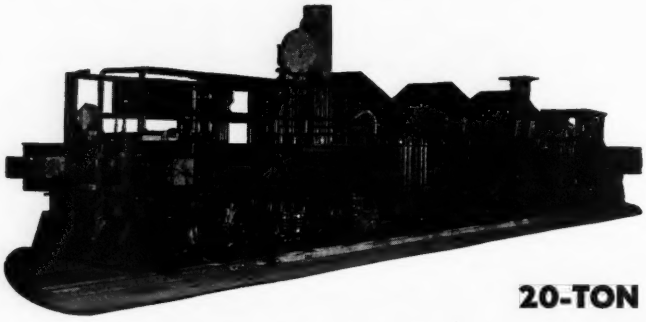
on page 147 will bring you more information on any new products and equipment in this section.

Built for STEEL MEN to give DEPENDABLE SERVICE

ATLAS CARS

40-TON BOTTOM DUMP SCALE CAR

Car has anti-friction bearings throughout, including axle mountings. Foot-operated "Dead Man" control is interlocked with air brakes to apply brakes automatically. Provided with Atlas all-steel scales and 30" indicating dial. Type printing recorder attachment provides automatic weight registration at skip pit. All standard safety features, including red marker lights and lights for illuminating the front of the bin.



20-TON DOUBLE HOPPER BOTTOM DUMP SCALE CAR

Car has Atlas underslung suspension scales with Atlas 24" scale dial with chart recording. Air brakes and air-operated discharge gates. Cast steel side-frame trucks with roller bearings.

Atlas Engineering Service is always at your service

THE ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS

1140 IVANHOE RD. CLEVELAND 10, OHIO, U. S. A.

tem is used for measurement and is available in both electric and pneumatic control. An adjustable microswitch assembly, operated by the cam, is optional.

Combined Hand-Screw Machine

USE REPLY CARD—CIRCLE No. 5

Low-speed production work and high precision secondary operations are both possible on a 10-inch hand-screw machine made by Globe Heat-Seal Inc., 3380 S. Robertson Blvd., Los Angeles 34, Calif. Machine offers a range of slow

. . . joins low-speed, high precision work

spindle speeds for heavy roughing work, fast spindle speeds for small diameter, close tolerance operations. Sixteen different speeds range from 184 through 3796 rpm.

Four-position quick change gear box makes instant speed selection possible. Design provides a 1-hp, two-speed, instant reversing motor to power the spindle. Twin v-belts reduce slippage to a minimum over the entire speed range. Precision tapered roller bearings in the headstock with takeup features help assure accuracy.

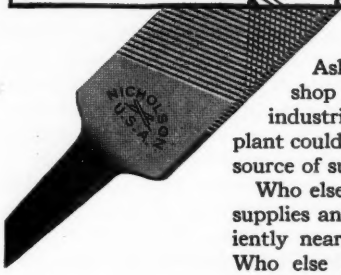
Combination Oil-Gas Burner

USE REPLY CARD—CIRCLE No. 6

Combination oil-gas burner, announced by Thermobloc Division, Prat-Daniel Corp., S. Norwalk, Conn., is available for the complete line of Thermobloc industrial type forced warm air direct-fired heaters. Burner permits instant changeover from gas to oil or oil to gas. It needs no piping changes or burner alterations and is switched automatically or with manual push-

POP'S school of filing

STEP UP, BOYS, AN' SHAKE HANDS WITH AN OLD FRIEND O' MINE! 'CASE YOU DIDN'T KNOW IT, HE'S ONE O' YOUR BEST FRIENDS, TOO!
SMART LOOKIN' FELLER — WHO IS HE?
SALESMAN FROM TH' INDUSTRIAL SUPPLY HOUSE. HE'S TH' GUY WHO GIVES US DOUBLE-QUICK DELIV'RIES WHEN WE NEED FILES!
STAN RANDALL



Ask Pop or any other experienced shop foreman what he thinks of the industrial distributor. He'll tell you the plant couldn't run without that dependable source of supply.

Who else has the tools, machines, parts, supplies and accessories you need, conveniently near and ready for fast shipment? Who else has the broad experience and product know-how to give your shop first-aid in production problems?

Your industrial distributor relieves you of a lot of headaches. He takes over the time-consuming work load involved in scattered direct-buying contacts. He expedites purchase orders and deliveries. He warehouses reserves that would otherwise tie up your own capital.

He knows more about a wider range of tools for industry than any one manufacturer can know. And he's always ready to help your men keep abreast of mechanical improvements and new techniques.

Take files: Your industrial distributor stocks a big assortment of all regular types, cuts and sizes, as well as many special types for special purposes and materials. His expert judgment in picking *The right file for the job* is of incalculable assistance on both exacting and mass-production work.

Marketing through distributors is a policy that has made Nicholson files and Nicholson quality available to industrial file users from coast to coast.

NICHOLSON U.S.A. **NICHOLSON FILE CO. • 71 ACORN STREET • PROVIDENCE 1, RHODE ISLAND**
(In Canada, Port Hope, Ont.)
BLACK DIAMOND TRADE MARK

NICHOLSON ... A FILE FOR EVERY PURPOSE

button. In effect, the unit always operates on the most economical fuel available. Simple and rapid changeover occurs during times when one fuel type is in short supply.

Gravity-Feed Oiling System

USE REPLY CARD—CIRCLE No. 7

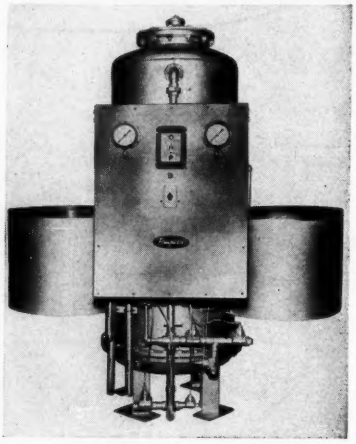
Single line gravity-feed oiling system, entirely automatic in operation, is announced by Oil-Right Corp., Manitowoc, Wis. System consists of a central reservoir with solenoid operated shut-off valve and several individual valves mounted directly into the bearings. Copper tubing connects the reservoir and all valves in series so gravity flow will be maintained.

Oil is released by gravity from a reservoir by a solenoid through tubing to an angle sight feed valve. From there it flows through an opening in the valve to the adjacent valve. This establishes a series connection, making oil available in each valve for discharge to bearings. A single reservoir feeds a maximum 24 bearings. Reservoir can be supplied in six sizes, from 9 ounces to 1 gallon.

Demineralizing Line Expanded

USE REPLY CARD—CIRCLE No. 8

Addition of an automatic unit to its line of demineralizing equipment is announced by Penfield Mfg. Co., Meriden, Conn. Automatic operation extends to all functions, including the regeneration cycle. When effluent's conductivity falls



. . . unit functions automatically

below standard, treated water is discharged automatically and warning system signals need for activation of a regeneration cycle. At this point, a switch is turned to begin the cycle, which includes rinsing and recutting in the effluent when desired purity is reached.

Regenerative tanks are refilled automatically with water. This permits fresh acid and caustics to be added in preparation for a succeeding cycle. Demineralizer is available in flow rates from a few gallons to 5000 gallons per hour.

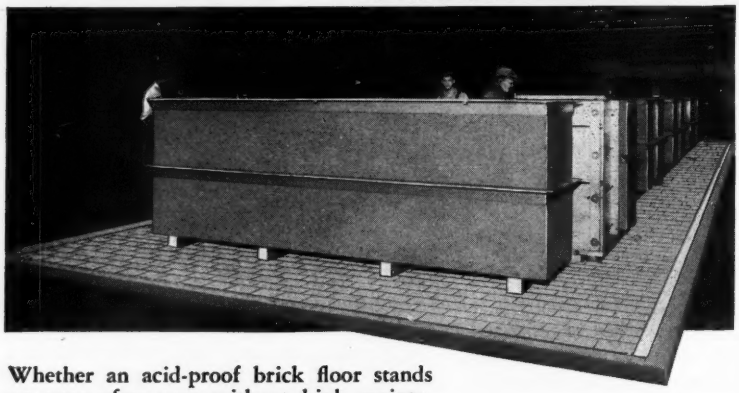
Machine Packages Small Parts

USE REPLY CARD—CIRCLE No. 9

Machine that counts and packages small parts by weight is introduced by Inter-Lakes Engineering Co., 4845 Bellevue, Detroit 7, Mich. Called the Weight-O-Pack, the unit provides packaging speed and also should avoid errors that occur in small parts packaging. Various shaped parts are placed in a 3 cu ft hopper. From there, a vibrating unit processes work into

FOR LESS MAINTENANCE OVERHEAD

put Durisite and Brick UNDERFOOT



Whether an acid-proof brick floor stands up year after year without high maintenance costs depends mostly on the joints between the bricks. The thinner the joint the better the chance for long, trouble-free life. But with ordinary bonding mortars you can't get a joint much thinner than ¼".

Durisite *acid-and-alkali-proof* cement, however, bonds brick double-tight with *extra thin* joints . . . $\frac{3}{32}$" or less. Not only does Durisite make a thin, strong joint, but it makes a dense, non-absorbent joint.

Durisite is a resin-type cement, sets quickly by internal chemical reaction, is non-toxic, non-explosive, non-inflammable.

U. S. STONEWARE

PROCESS EQUIPMENT DIVISION, AKRON 9, OHIO

FOR A FLOOR YOU CAN INSTALL, AND FORGET, INSIST ON "U.S." TRIPLE-CONSTRUCTION

4" to 6" rigid concrete sub-base

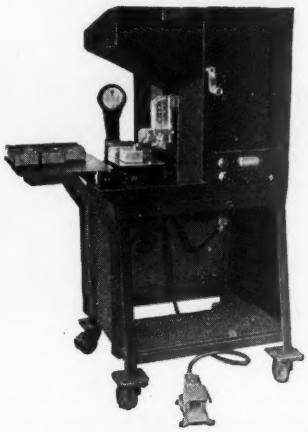
Resilon corrosion-resistant protective membrane

"USSCO" Acid Brick bonded with double-tight Durisite thin joints.

The U. S. Stoneware Co. can supply all necessary materials for installation by your own workmen of a "triple-construction" acid-and-alkali-proof floor, or if you desire, we can handle the entire job, including labor and materials.

the packages. The latter are placed on a platter of a balance-type scale that controls flow of material. When the required amount of material is packaged, the scale de-energizes the vibrating unit to stop the flow of parts.

Machine is activated by a hand or foot switch; emergency stop-



. . . performs counting function by weight

button can cut the flow at any time. Standard unit handles packages weighing a maximum 10 pounds. Heavier packaging needs can be treated on special order.

Welding Oven Dries Electrodes

USE REPLY CARD—CIRCLE No. 10

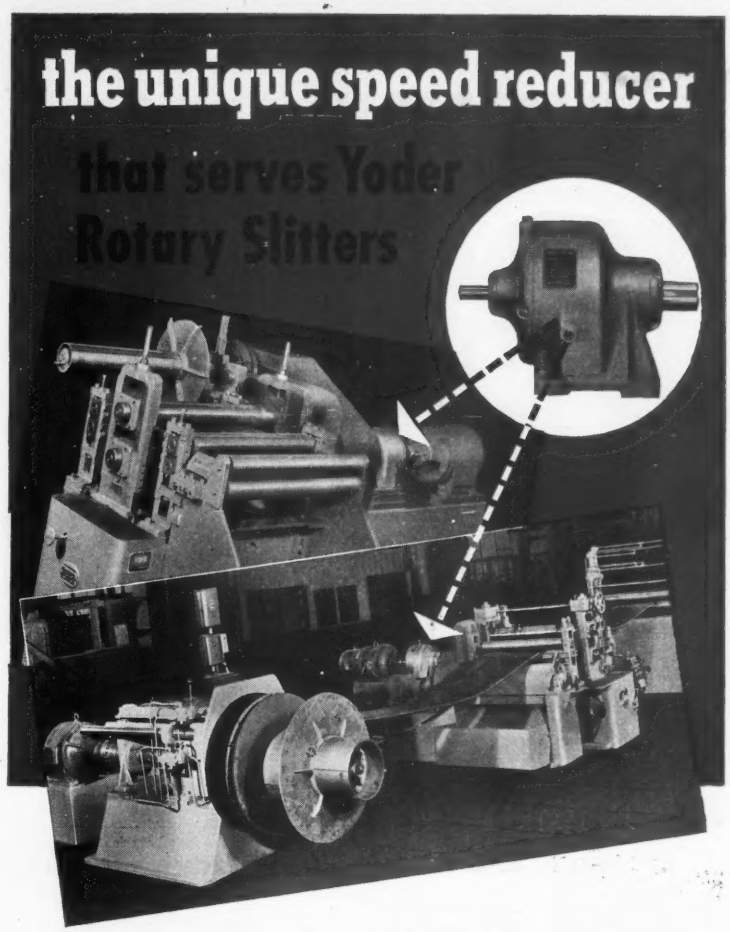
Welding rod drying oven, the model WRD-1, designed to eliminate moisture absorption in low hydrogen and other coated electrodes is a product of Despatch Oven Co., Minneapolis 14, Minn. Its application should help maintain an even flow of work by bringing gravity convected heat and economical storage to the job site.

Square, compact unit has 10 separate compartments that hold 250 pounds of electrodes. Compartments are removable for handling larger parts. Reinforced mesh shelving permits efficient circulation of heat and also controls moisture.

Processor for 55-Gallon Drums

USE REPLY CARD—CIRCLE No. 11

Spray-type processing machine for 55-gallon drums is announced by Morrison Industries Inc., 17700 Broadway, Bedford, O. Processor operates through nine stages com-



Coiled strip stock in *any* width . . . *when* you need it and at *lower cost!* That's what shops equipped with Yoder Rotary Slitters are assured. For with these dependable machines, the delays and higher costs of special width stock are eliminated. Mill-width coils (always more readily available) may be slit to requirements on a moment's notice.

In designing machines to fulfill such a key assignment, The Yoder Company must naturally exercise extreme caution in selecting so vital a component as a speed reducer. And it certainly does! No. 2, 2½ and 3 sizes (two are illustrated) are equipped with compact, horizontal, Winsmith (pat.) Differential Gear Reducers . . . *unique among speed reducers!*

The heart of this design is a 6-gear planetary element, free within its housing to float into the most equalized load distributing position. Even wear, automatic compensation and alignment, smooth, enduring operation are thus assured.

For requirements within the 1/100 to 85 hp range, with ratios from 1.1:1 to 50,000:1, Winsmith is the name most remembered. Information in "Save through Standardization" folder. Write.

WINSMITH
SPEED REDUCERS

MEMBER OF AGMA

Winsmith, Inc.

PRECISION

TO LESS THAN .0005 INCH

on H & S worms and worm gears

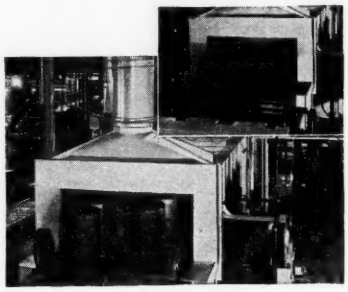
• Checking an H & S Worm & Gear on a precision inspection fixture for accuracy to less than .0005" on both indexing and lead...an accuracy that insures perfect thread contour and balance. These exceedingly close limits are obtained by the company's use of its own exclusively designed grinding machines. It's precision in manufacturing that insures higher efficiency, longer life and quieter operation. Yet this extreme precision is only one of seven outstanding features that are your guarantee of the finest worms and gears possible.

THE HORSBURGH & SCOTT CO.
GEARS AND SPEED REDUCERS
5112 HAMILTON AVE. • CLEVELAND 14, OHIO, U.S.A.

Send note on Company Letterhead for 488-Page Catalog 49

prising alkali wash, sulphuric acid pickling and phosphate coating to prepare drums for painting. If necessary, drums can be processed both inside and out. Machine's basic principles are said to be adaptable for processing any product.

Advantages attributed to the continuous process include more



. . . operates through nine stages

rapid operation with less manpower and better work control resulting in a more uniform product through the one-machine setup. Enclosed design eliminates hazards from fumes, odors and splashes.

Tower Reaches 90 Feet

USE REPLY CARD—CIRCLE No. 12

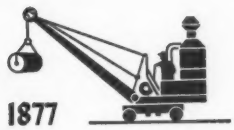
Atlas Industrial Corp., 849 39th St., Brooklyn, N. Y., offers its Hi-Lift telescopic tower for heights above 30 feet. Tower begins at 6 feet and extends by electric power to its full height in about 5 minutes. Equipped with roller bearing swivel casters on all four legs it has outriggers for extra stability and maneuvering in tight places. Tower can be extended to any desired height under one-man operation.

High-Speed Disk Grinder

USE REPLY CARD—CIRCLE No. 13

Precision disk grinder, 9 inches long and weighing 4½ pounds, is introduced by Balmar Corp., Woodberry, Baltimore 11, Md. Designed for one-hand operation, the tool is used for continuous duty in welding shops and foundries for polishing, grinding, sharpening and shaping all types of metals. Its speed of about 8000 rpm permits applications in cleaning castings, knocking off sprues, gates and risers,

BROWNHOIST finest, most modern CRANE . . . the result of 75 years of progressive engineering

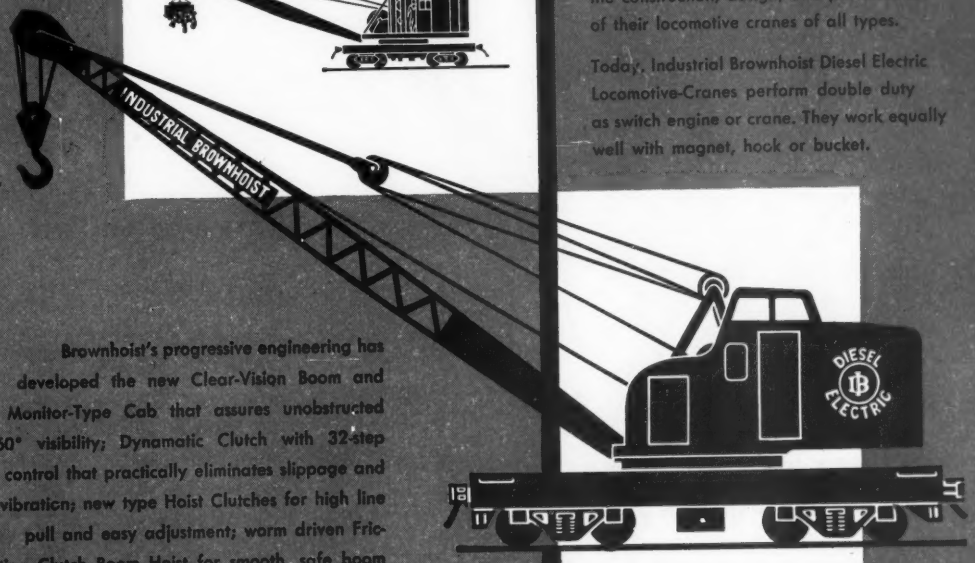


1877

1927

Even in 1877 the first little coal-fired Brownhoist cranes were known as the best locomotive cranes of their day. Every year since, Brownhoist engineering has constantly improved the construction, design, and performance of their locomotive cranes of all types.

Today, Industrial Brownhoist Diesel Electric Locomotive-Cranes perform double duty as switch engine or crane. They work equally well with magnet, hook or bucket.



1952

Brownhoist's progressive engineering has developed the new Clear-Vision Boom and Monitor-Type Cab that assures unobstructed 360° visibility; Dynamatic Clutch with 32-step control that practically eliminates slippage and vibration; new type Hoist Clutches for high line pull and easy adjustment; worm driven Friction Clutch Boom Hoist for smooth, safe boom operation. Optional features on Brownhoist cranes today include Dual Controls, 8-Wheel Chain Drive for increased drawbar pull, Twin Engine Drive for greater traction and Timken Roller Bearing Journals. Brownhoist Diesel-Electric Locomotive Cranes are available in capacities from 30 to 80 tons.

BROWNHOIST builds better cranes

INDUSTRIAL BROWNHOIST CORPORATION • BAY CITY, MICHIGAN • DISTRICT OFFICES: New York, Philadelphia, Cleveland, San Francisco, Chicago, Canadian Brownhoist, Ltd., Montreal, Quebec • AGENCIES: Detroit, Birmingham, Houston, Los Angeles

154

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Camcar Production and Engineering —Perfected particularly for precision manufacture of special cold-headed parts and fasteners— Guarantees the refinements necessary to meet all A.N. specifications.

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CAMCAR SCREW & MFG. CORP.

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"PRODUCTION-DESIGNED for your Assembly Line"

dressing welded spots, removing chill nails and grinding surfaces to a smooth finish.

Grinder is powered by a universal motor, 110 v, ac or dc, housed in an aluminum alloy cast-

. . . 9-inch tool weighs 4½ pounds

ing. Three composition disks, Nos. 36, 80 and 120 grit, are used with the tool. Disk size is 4 inches diameter, 3/32-inch thick.

Telescoping Steel Shore

USE REPLY CARD—CIRCLE No. 14

Self-contained, telescoping steel shore that can be handled by one man and permits micro-adjustment is announced by Safway Steel Products Inc., 6234 W. State St., Milwaukee 13, Wis. Three sizes are introduced, covering a range from 6 to 15½ feet above the mounting surface. Load-carrying capacities reach 9900 pounds with adequate safety factor, through use of special sleeve nut design.

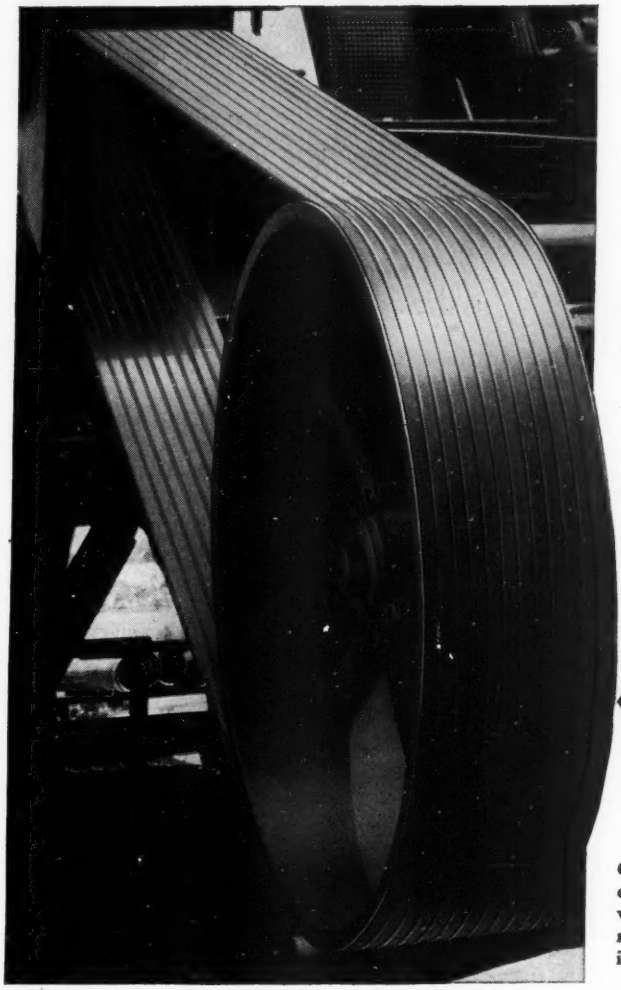
Shores are used without jacking devices or other separate accessories. Final adjustment is obtained by rotating a threaded sleeve nut tested to 40,000 pounds.

Heavy-Duty Industrial Trailer

USE REPLY CARD—CIRCLE No. 15

Kilbourne & Jacobs Mfg. Co., Columbus, O., offers a 15-ton capacity trailer for use as an assembly dolly in line production of heavy equipment. Trailer is tractor-drawn throughout the stations on the line. To provide uniform load at distribution, wheel suspension is designed so each four-wheel truck is mounted on a heavy

How to Prevent Premature V-Belt Failure through Correct Installation!



DON'T pry V-Belts over edge of sheaves. (This can *injure* even the toughest belt structure.)

DO adjust take up by moving motor or by other means until belts can be placed on sheaves without pressure.

DO move motor back after belts are placed in grooves until tension is adequate and all belts are tight.

DO SPECIFY Bull Dog V-Belts

... their specially engineered cord section has high tensile strength designed for superior load carrying capacity, the ability to absorb shock loads and share the load equally.

Get the *complete* Bull Dog V-Belt quality story on covers, cords and compounds from your BWH distributor. And while you're about it, ask him about BWH power transmission belting, conveyor belting and hose. We're specialists in making mechanical rubber products work *better, longer!*

BWH DEPENDABLE RUGGEDNESS

Another Quality Product of

BOSTON WOVEN HOSE & RUBBER COMPANY

Warehouse Stock: 111 N. Canal St., Chicago, Illinois Distributors in all Principal Cities

PLANT: CAMBRIDGE, MASS. • P. O. BOX 1071, BOSTON 3, MASS., U. S. A.

individual swivel. Another advantage of this type suspension is ability to operate at full rated capacity over rough floor and yard areas that might cause wheel or axle failure by concentrating the load on a single wheel.

Rack Adjustment Simplified

USE REPLY CARD—CIRCLE No. 16

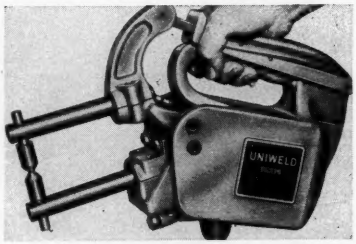
Adjustable pallet rack, added to its line of handling and storing equipment, is announced by Berger Mfg. Division, Republic Steel Corp., Canton, O. Rack can be designed to user's actual specifications, up to a maximum 60 x 60 x 120 inches. It can be furnished with extra-heavy tubular supports or solid shelves.

Heavy-gage upright members are notched on 6-inch centers from 14 to 92 inches. One man can move a shelf up or down within the rack in about 30 seconds. Notches are formed to eliminate horizontal slipping or rolling of the extra heavy tubes. Rack carries a maximum 3000 pounds per shelf and can be furnished in single or double face and single or double entry groups.

Portable Spot Welder

USE REPLY CARD—CIRCLE No. 17

Welding Service & Supplies Co., 1830 S. Cicero Ave., Cicero 50, Ill., offers a portable spot welder with semiautomatic timing control. Welder's leverage design exerts high forging pressure to make welds with ¼-inch combined thickness on mild or stainless steel and



. . . has semiautomatic timing control

⅛-inch on aluminum. Automatic switch connected to the welder's handle turns on the current when the toggle linkage applies maximum pressure to the welding spot. Called the Uniweld model 275, the unit operates on 200 to 240-v, single phase, 50 to 60 cycles.

Coating Protects Aluminum

USE REPLY CARD—CIRCLE No. 18

Tri-Tex-Protex, developed by P. & H. Chemical Co., Carlstadt, N. J., is a transparent liquid that can be brushed, sprayed, dipped or oven baked on aluminum or over aluminum paint. It eliminates rust and resists mild chemicals, gasoline, water and soap.

Two Tools in One

USE REPLY CARD—CIRCLE No. 19

A lathe tailstock, centering device and taper turning attachment is offered by Master-Taper Co., Chicago 40, Ill. It is made in two sizes, one with No. 2 Morse taper shank and the other with No. 3, 4 or 5 Morse taper shank.

Repairs Concrete Floors

USE REPLY CARD—CIRCLE No. 20

Ruggedwear resurfacer, available from Flexrock Co., Philadelphia 4, Pa., can be applied without any chipping or chopping when

Draw a circle—a 50-mile radius—from Trenton, New Jersey, and you encompass New York and Philadelphia, which comprise the world's largest market. That fact gives you quick insight into the big *news* about New Jersey, where *new* opportunities for industry are opening all the time.

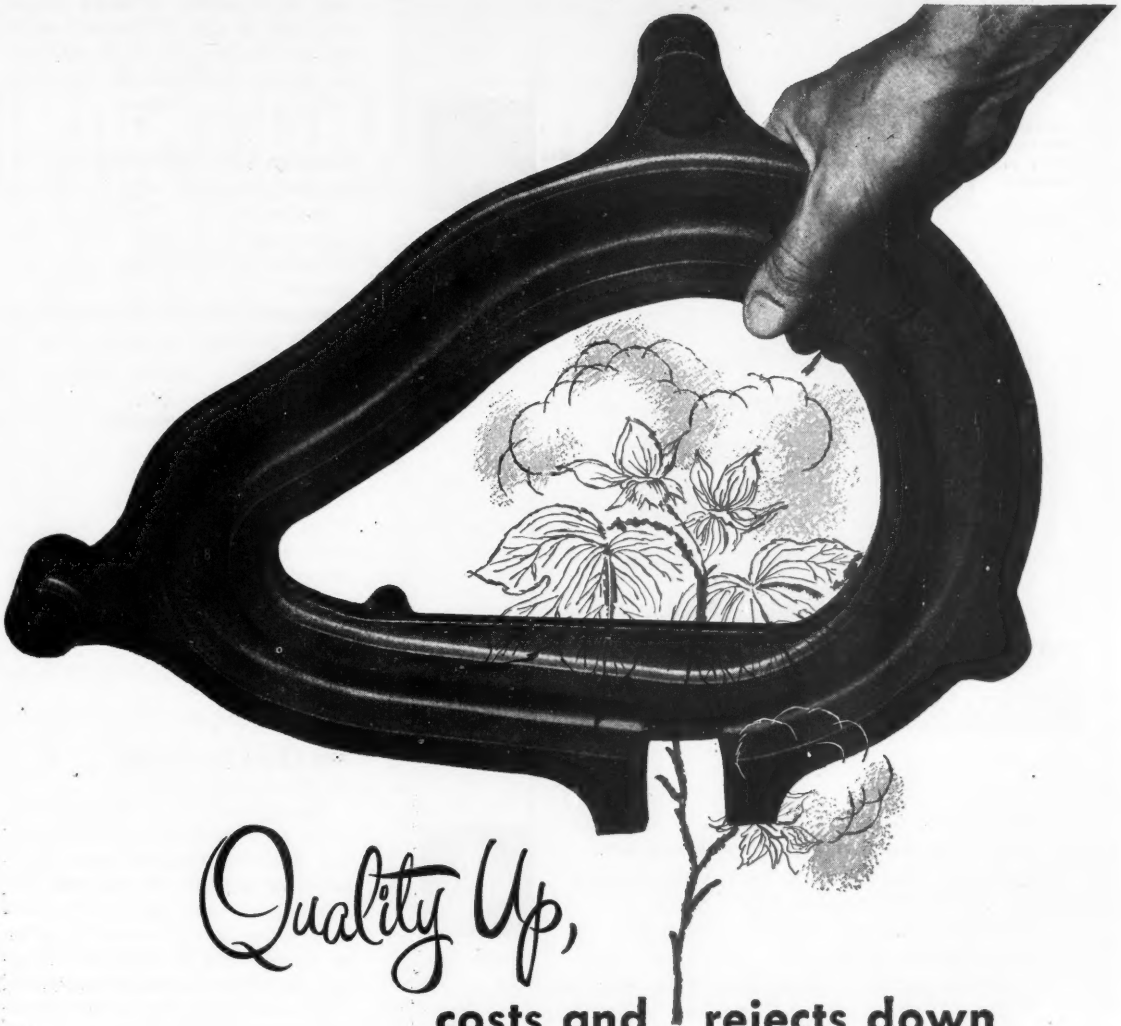
Drop a small pebble in a pool of water and watch the ripples flow to its edges. In the same way, place a small manufacturing plant in the industrial pool in New Jersey and you can see its products flowing to *new* richer markets.

Many *new* industries in New Jersey are reaching this tremendous buying area today. And there are more *new* markets for local industry which can be reached by overnight freight. A 250-mile radius from Trenton encircles the highest income market in the nation—an area with a population of nearly 48 million people, with an estimated income average of $5,134 per family.

Add a *new* basic steel plant to this area . . . plus *new* research plants, *new* highways, and *new* opportunities for plant sites . . . and you find some of the *new* reasons why industry succeeds in New Jersey, the Crossroads of the East.

For more information on what's new in New Jersey, write Box G, Public Service Electric and Gas Co., 76 Park Place, Newark, N. J., for the new booklet, "An Industrialist's View of the Crossroads of the East."

PUBLIC SERVICE



Quality Up, costs and rejects down WITH CRUCIBLE TOOL STEEL CASTINGS

The steel part shown above used to be a production headache. A cam for a cotton picking machine, it was originally flame cut from SAE 8730 boiler plate, machined and heat treated. Other difficult steps included end-milling and finish-grinding the cam track. Rejections were high, because the cam often warped during heat treatment.

The problem was solved by casting the cam in Airkool®, a Crucible air-hardening tool steel. When the customer receives the casting from Crucible, all he has to do is finish it, mill the cam track and heat treat. He doesn't have to finish grind — Airkool is non-deforming when properly hardened and tempered. Machining costs are way down and quality is up, since Airkool resists wear far better than the low alloy steel from which the part used to be made.

Crucible's casting facilities often make it possible to use wear- and abrasion-resisting tool steel for complicated machine parts. We may be able to help you just as we helped the cotton picking machine manufacturer. Get in touch with Crucible today!

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52 years of Fine steelmaking

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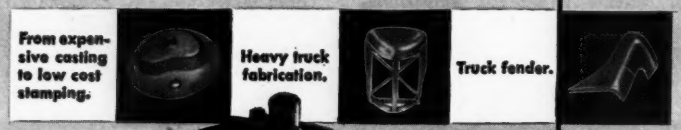

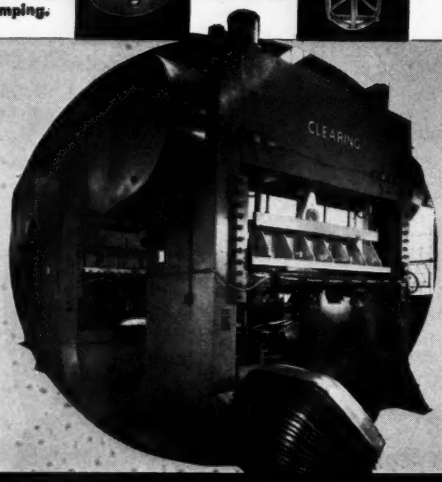

NO GAME OF CHANCE . . .

Getting the best from presses is an operator's stock in trade in the contract stamping business. Competition is keen, and successful old timers, like Briskin Mfg. Co., Chicago, didn't get that way without a great deal of production skill.

Briskin put their money on Clearing presses because Clearings gave them the maximum quality, economy, on-schedule production and minimum waste that are the watchwords of Briskin production. Die regrinds are few and far between and maintenance costs are lower, too.

Where competition is tough and economical production means a winning hand, Clearing presses are dependable assets. Looking at results is a good way to choose *your* press equipment too! For production, your best choice is Clearing.

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HAMILTON DIVISION, HAMILTON, OHIO

CLEARING PRESSES
THE WAY TO EFFICIENT MASS PRODUCTION

used as a patch. It bonds secure and tight to the old concrete right up to a feather edge. It can also be used as a complete overlay over almost any type of floor.

Bourdon Tube Type Switch

USE REPLY CARD—CIRCLE No. 21

Hydro-Aire Inc., Burbank, Calif., announces a bourdon tube type pressure switch for use with air, aircraft fuels, hydraulic fluids or lubricating oils. It is available to handle pressure in ranges from 0 to 1500 psi.

Spot Welding Electrode

USE REPLY CARD—CIRCLE No. 22

Kaptrode resistance welding electrode, developed by Weiger Weed & Co., Detroit 4, Mich., is available in No. 3 Morse taper sizes. This expendable cap type electrode fits into a semipermanent adapter shank that fits any standard electrode holder of No. 3 Morse taper size. It is made in six nose styles.

Jaw Chuck for Grinder

USE REPLY CARD—CIRCLE No. 23

Royal Oak Tool & Machine Co., Royal Oak, Mich., announces a six-jaw chuck for the D-S radial relief grinding fixture. It permits the grinding of tools not readily held in a collet or for which no collet in correct size is available. Unit has an adjustable back plate that assures concentricity within 0.0005-inch total indicator runout.

Open Channel Flow Meters

USE REPLY CARD—CIRCLE No. 24

Series 500 open channel flow meters for measuring, recording and controlling the flow of water, sewage, industrial plant effluent and other liquids, is announced by Bristol Co., Waterbury 20, Conn. Two general types are offered: Mechanical type in which cam mechanically moves pen arm across

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INFORMATION

AVAILABLE FOR THE ASKING

70. Brazing Alloys

Handy & Harman—A highly Informative handbook on low temperature brazing, 24-page illustrated bulletin 20 discusses Easy-Flo and Sil-Fos silver brazing alloys used to join ferrous and nonferrous metals or nonferrous metals only. Instructions for designing joints for brazing, six brazing steps, two methods of alloy application and heating methods are shown and outlined. Chart showing alloys conforming to military and federal specifications is included.

71. Die Casting Lubricants

E. F. Houghton & Co.—Four die casting lubricants which provide clean, accurate castings; long die life and economical production are subject of 4-page illustrated bulletin "Houghton's Die Casting Lubricants." Properties and procedures are outlined.

72. Vapor Lamp Transformers

Jefferson Electric Co.—16-page illustrated bulletin 521-5 catalogs mercury vapor lamp transformers for multiple circuit and series lighting service. Dimensional drawings, specifications and various installation photos are offered. Some technical data for mercury vapor lamps are also tabulated.

73. Collets & Feed Fingers

Hardinge Brothers, Inc.—"Why They Are Preferred" is title of illustrated 12-page bulletin which points out advantages of style S Master collets and style B Master feed fingers. Former features no work pressure on screw, while latter has no pins or screws so pads cannot work loose.

74. Metal Cleaning

Hanson-Van Winkle-Munning Co.—Six different methods of metal-cleaning are defined in bulletin C-107 which also lists cleaners to use for aluminum, brass, bronze, copper, lead alloys, magnesium, steel, iron, and zinc-base die castings. Section on soak cleaners and electrocleaners is included. Cleaning is prior to electroplating, anodizing or painting operations.

75. Ram Turret Lathes

Jones & Lamson Machine Co. — Completely redesigned line of ram type universal turret lathes is featured in 24 page catalog No. 101. Photos and text describe various component assemblies where improvements are incorporated. Dimensional drawings and general specifications covering models 3, 4, 5, 5-3 and 5-4½ which range in spindle speed from 30 to 1500 rpm are presented.

76. Hydraulic Scale

Hydroway Scales, Inc.—Reasons why you should have and use the Hydroscale, which functions hydraulically, are outlined and pictured in this 6-page folder. Scale weighs the load as you lift it with crane and is offered in standard models up to 50 tons capacity. Specifications of all models are given.

77. Industrial Ovens

Jensen Specialties, Inc.—16-page brochure on Pan-L-Heat ovens has table on steps in selecting industrial heating equipment. Other sections deal with material handling methods, typical temperature cycles, new heat application methods, available fuels and auxiliary equipment. Also other charts and tables.

78. Adjustable Flow Valves

Hauck Mfg. Co.—Besides giving much valuable general information on operation and construction, 8-page illustrated catalog No. 713 tells you the approximate maximum air and gas capacities for line of adjustable flow valves. Diagrams and dimension of single and dual valves are given.

STEEL 5-26-52

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79. Carburizing Baths

A. F. Holden Co.—Some very factual data on case depths vs. time at various temperatures for carburizing baths are charted in 4-page illustrated bulletin. Advantages, pot capacities and costs using 100 per cent water soluble carburizing baths are cited.

80. Self-Cleaning Filter Belt

Honan-Crane Corp.—If you are interested in cutting coolant filtration costs up to 75 per cent, send for and read 4-page illustrated bulletin on the Web-O-Matic self-cleaning web type filter for individual machine tools or small central coolant systems. Ramp and bottom discharge types are shown. Charts show specs for both models.

81. Insulation & Refractories

Illinois Clay Products Co.—Various types of fire clay brick and clays and chemical bonded refractory bricks as well as high temperature vermiculite insulations are described in 4-page bulletin "Refractories and Insulation."

82. Motor-Pumps

Ingersoll-Rand Co.—12-page illustrated bulletin 7177 presents a picture of the I-R Motorpump line and deals specifically with its use in the air conditioning field. These vertical and horizontal pumps are integral with motor and are offered in ¼ to 50-hp sizes.

83. Heat Treating Furnace

Hevi Duty Electric Co.—Included in 28-page illustrated bulletin HD 646 are sections on construction, carburizing processing gases and procedure, nitriding procedure and other uses for Carburizer-Nitrider furnace. Photo section shows variety of installations, and specs are provided.

84. Ladle Lining

Ironton Fire Brick Co. — Ironton Nojoint rammed lining for desulphurizing ladles is subject of 8-page illustrated bulletin No. 102. Step-by-step procedures for form building and ladle lining are explained pictorially. Ladles lined with this material will resist soda ash slags.

85. Magnetic Alloys

International Nickel Co.—20-page illustrated manual "Iron-Nickel Alloys for Magnetic Purposes" discusses the importance of "magnetically soft" alloys. Tables and charts correlate chemical composition with magnetic properties trade names and sources of supply. Typical applications are suggested for alloys depending upon their predominant characteristics.

86. Socket Cap Screws

Holo-Krome Screw Corp.—Listing of flat head socket cap screws, sizes available, information on features and laboratory testing methods used on them are contained in pocket-sized 4-page folder FH-512.

87. Sectional Belt Conveyors

Hewitt-Robins Inc., Robins Conveyors Div.—Need a sectional belt conveyor for handling bulk materials? If so, send for 4-page bulletin No. 132-A. It is crammed with photos, data, and details of easily erected, operated and maintained conveyors.

EDITORIAL REPRINTS:

88. Production Gaging

Making a profit on many manufacturing operations may depend on the gaging method used. Ed Karpick, STEEL Associate Editor, discusses some of the latest inspection equipment as used by leading manufacturers in reprint entitled "Production Gaging: Maximum Accuracy at Minimum Cost." He covers automatic dimensioning and segregating machines and multiple point checking units.

89. Phosphate Coating

"Accelerated Phosphate Coating Fits High Speed Finishing Setups" is title of STEEL reprint of article by N. Kuperschmid which gives details of an accelerated phosphate prepainting treatment being effectively used on zinc and cadmium parts. Process utilizes product called Anchorite 100 and forms an integral microcrystalline surface which is corrosion resistant and holds paint tenaciously to metal.

90. Boron Steels

Medium-carbon boron treated steels are satisfactory substitutes for present alloy grades on basis of hardenability, and heat treatment is no problem, according to J. D. Graham in STEEL reprint "Heat Treating Boron Steels . . . Machinability Can Be Improved." Author also talks about draw temperatures, effects of carbon content, surface hardness and machining of boron steels.

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chart; electric type that uses the company's timed-impulse type of remote recording.

Heavy Duty Torch

USE REPLY CARD—CIRCLE No. 25

Lightweight heavy duty Bazooka torch, introduced by Industrial Engineered Products Co., Los Angeles 46, Calif., has a self-cooled adjustable pistol grip handle. It is operated from standard liquid petroleum gas (butane-propane) cylinders at tank pressure with no gas regulator required.

Marks Dies and Tools

USE REPLY CARD—CIRCLE No. 26

Recipro-Tool, introduced by S.C. & L. Machine Co., Rockford, Ill., will mark any shaped object and any hardness of material. The hand tool is available with carbide or diamond points and file, chisel, or various type bits. It operates on 110 v, 60 cycle ac circuit.

Floating Tap Holder

USE REPLY CARD—CIRCLE No. 27

JT floating tap holder, announced by Scully-Jones & Co., Chicago 8, Ill., is designed for use in multiple spindle machines. It has double gear spline drive coupling for the neutralizing or intermediate driving member, similar to the JA model. Clearance between mating splines allows free movement at all times.

Die Cushion

USE REPLY CARD—CIRCLE No. 28

A fully hardened and ground pin pressure pad to fit the press bed opening assures accurate alignment of the pad in the die cushions offered by Dayton Rogers Mfg. Co., Minneapolis 7, Minn. The semisteel cushions can be fastened directly to the bolster plate or provided with a mounting plate so they can be installed on the press bed.

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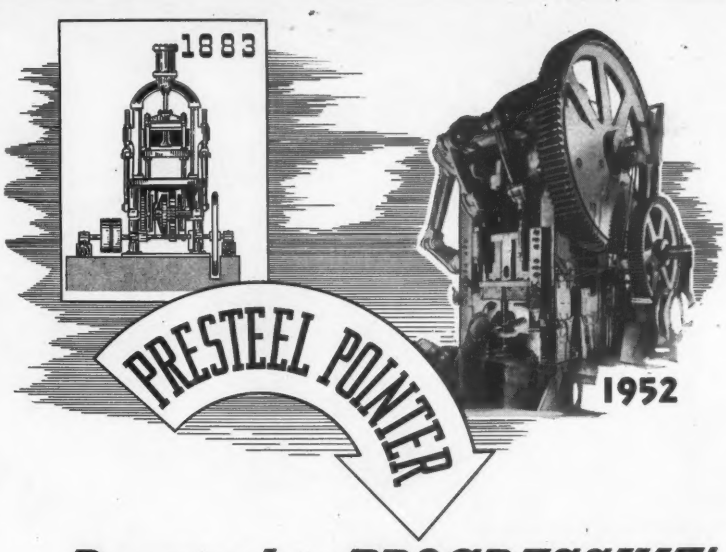

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PRESTEEL is a leader of research in metals and in the development of metal craftsmanship — is actively associated with such groups as Pressed Metal Institute, American Society for Metals, American Society of Tool Engineers, American Society of Mechanical Engineers, National Association of Manufacturers, Associated Industries of Massachusetts—and many other technical and industrial organizations.

At Presteel, we are small enough to assure personal attention — to maintain friendly relations with our plant and with the public, yet we are large enough to develop an aggregation of top talent, who have built an outstanding company reputation for dependable results.

These endeavors perpetuate the efforts and ideals of Presteel's founders . . . that the organization may become of greater service to you — as a part of American industry.

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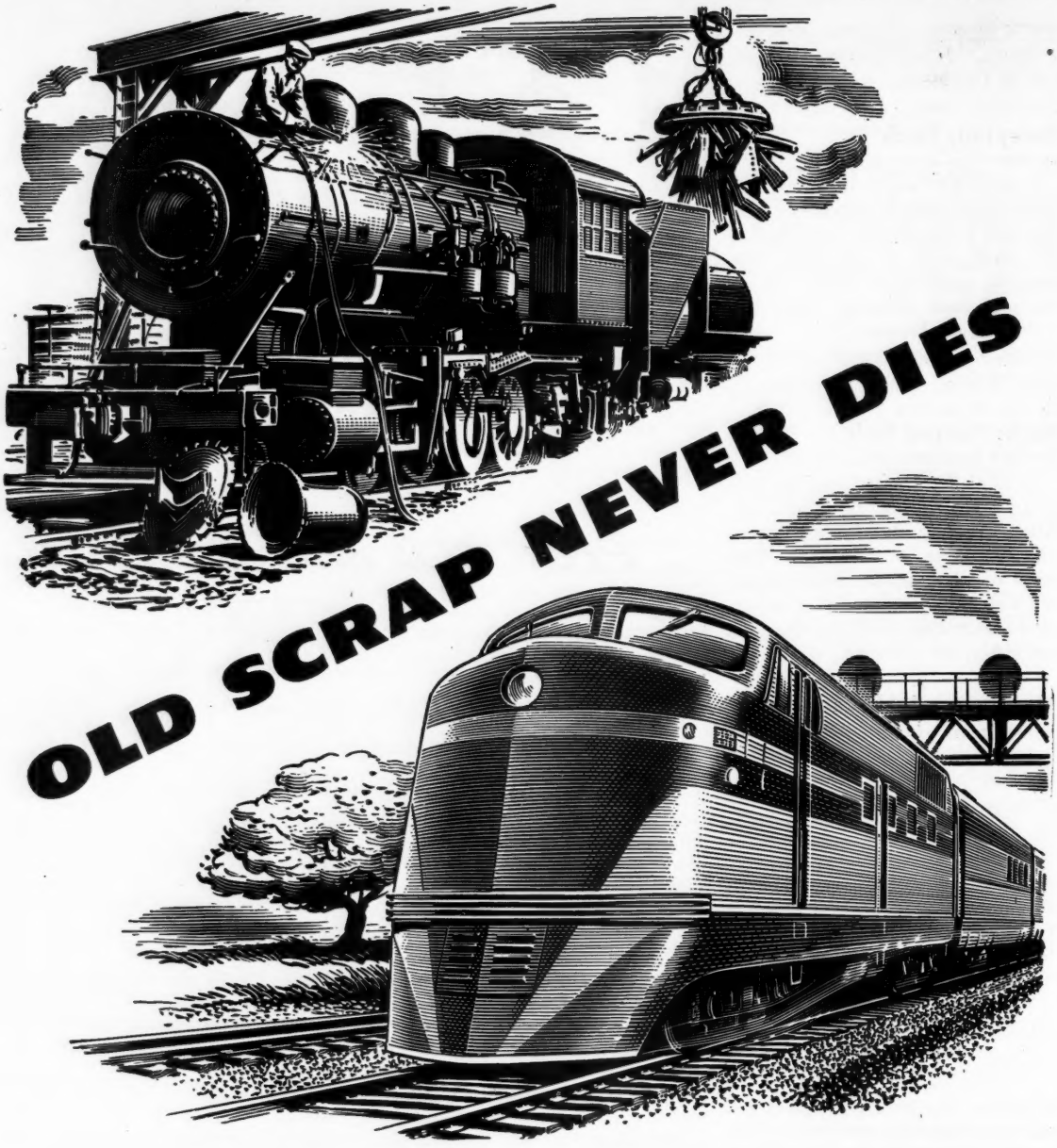

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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

The Market Outlook

THERE are new signs that the day of enough steel for all is not far away.

Balance between supply and demand has been improving for several months but some products, notably large size carbon bars and heavy plates, are still hard to get. Now there's a clue that the pressure for bars may ease up.

For some time the increasing stringency in hot-rolled carbon and quality bars has been attributed to a great extent to mounting requirements of the military shell and fuse programs. There is growing indication that shell makers are receiving directed shipments of bars much in excess of use and that inventories are expanding to total six months or more.

DIFFERENT ATTITUDE—Another sign that steel mills think they are catching up with demand is their attitude toward scrap. A few months ago many mills were operating on hand-to-mouth supplies of scrap and the government was shunting scrap from here to there to keep mills going. Now evidence continues to pile up that the edge is off scrap demand. Even though they are consuming scrap at capacity rates, mills have built up scrap inventories to as much as a 60-day supply. Consequently, mills are much more choosy, and there are reports of price shading on some steelmaking grades. Some scrap dealers have been advised to clear their yards of high-price scrap.

Helping the steel supply catch up with demand is the high rate of steel output. Production last week had recovered fully from the steelworkers' strike and equalled the year's high of 102 per cent of capacity. This is equivalent to 2.1 million tons.

GETTING BIGGER—Assisting the steel industry in its output effort is its growing capacity. The bulk of the additional capacity being realized from the current expansion program will come into operation this year and will push the already record high capacity to a further new record.

Some of the steel products that came into easier supply earlier this year show further signs of weakening. One of them is structural shapes, which only a few months ago appeared to be in such strong demand that the government put restrictions on construction. Since the lifting of many of these restrictions, new building projects and plant expansions have not developed as rapidly as was anticipated, and demand for structurals is waning.

CONTRAST— On the other hand, the earlier easing in demand for hot-rolled and cold-rolled carbon steel sheets has disappeared. This is largely the result of relaxation of government restrictions on production of automobiles. But then, the demand from the auto industry should be high now, for this is the time of the year when autos sell best.

Demand for galvanized sheets, which had been in short supply because of a scarcity of zinc, shows no signs of being satisfied yet.

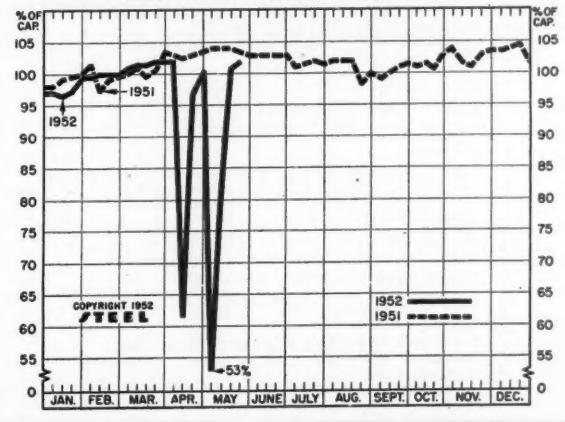
Some producers of silicon sheet used in small motors could stand more business. So could producers of straight chromium sheets.

NO LET-UP— Pressure is still on for supplies of thick and wide carbon steel plate. Atomic energy needs are active, and an increasing demand is noted for ship work. One feature of the latter demand is a stepping up in specifications for plates for strapping a number of cargo ships which have been inactive since World War II. This strapping, plates placed inside the hull, provides added strength. Utilities are taking an increasing amount of heavy plate for heat exchangers and boilers.

LOOK FOR BUSINESS—Warehouses continue to find it increasingly necessary to sell, although they still are plagued with imbalances in stocks. In some instances, warehouses are strengthening their sales staffs.

Demand for merchant pig iron continues to ease off. The supply has improved to the point that the Merchant Pig Iron Industry Advisory Committee asked the government to remove inventory controls on pig iron or at least increase the limit to 90 days.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended May 24	Change	Same Week 1951	Same Week 1950
Pittsburgh	103.5	+ 2*	96.5	103
Chicago	103.5	+ 0.5	107	104.5
Mid-Atlantic	94	+ 6	101.5	98
Youngstown	105	0	105	107
Wheeling	97.5	0*	99	108
Cleveland	104	+ 0.5*	101.5	99.5
Buffalo	104	0	104	104
Birmingham	102	0	100	100
New England	70	0	92	85
Cincinnati	94.5	+ 4.5	104	106
St. Louis	87	+ 3.5	99.5	91
Detroit	110	+ 4*	106	103
Western	104	+20	103	94.5
Estimated national rate	102	+ 1	103.5	101

Based on weekly steelmaking capacity of 2,077,040 tons in 1952; 1,999,034 tons for 1951; 1,928,721 tons for second half, 1950; 1,906,268 tons for first half, 1950.

* Change from revised rate for preceding week.

The Metalworking Outlook—p. 39 Production-Engineering News—p. 75

Composite Market Averages

FINISHED STEEL INDEX, Weighted:

	May 22 1952	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100) ..	171.92†	171.92†	171.92†	171.92	118.67
Index in cents per lb.	4.657†	4.657†	4.657†	4.657	3.215

ARITHMETICAL PRICE COMPOSITES:

Finished Steel, NT	$106.32†	$106.32†	$106.32†	$106.32	$69.82
No. 2 Fdry, Pig Iron, GT..	52.54	52.54	52.54	52.54	32.99
Basic Pig Iron, GT	52.16	52.16	52.16	52.16	32.49
Malleable Pig Iron, GT ...	53.27	53.27	53.27	53.27	33.71
Steelmaking Scrap, GT	43.00	43.00	43.00	44.00	29.42

Weighted finished steel index based on average shipments and Pittsburgh district prices of the following 14 representative products during 5-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

† Primary, pending 1952 tin plate contract price announcement.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	May 22 1952	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh.....	3.70	3.70	3.70	3.70	2.60
Bars, H.R., Chicago	3.70	3.70	3.70	3.70	2.60
Bars, H.R., del. Philadelphia	4.252	4.252	4.223	4.20	2.98
Bars, C.F., Pittsburgh.....	4.55	4.55	4.55	4.55	3.20
Shapes, Std., Pittsburgh...	3.65	3.65	3.65	3.65	2.50
Shapes, Std., Chicago	3.65	3.65	3.65	3.65	2.50
Shapes, del. Philadelphia...	3.93	3.93	3.918	3.91	2.64
Plates, Pittsburgh	3.70	3.70	3.70	3.70	2.65
Plates, Chicago	3.70	3.70	3.70	3.70	2.65
Plates, Coatesville, Pa.	4.15	4.15	4.15	4.15	2.80
Plates, Sparrows Point, Md.	3.70	3.70	3.70	3.70	2.65
Plates, Claymont, Del.	4.15	4.15	4.15	4.15	2.80
Sheets, H.R., Pittsburgh...	3.60-75	3.60-75	3.60-75	3.60-75	2.50
Sheets, H.R., Chicago	3.60	3.60	3.60	3.60	2.50
Sheets, C.R., Pittsburgh...	4.35	4.35	4.35	4.35	3.20
Sheets, C.R., Chicago	4.35	4.35	4.35	4.35	3.20
Sheets, C.R., Detroit	4.55	4.55	4.55	4.55	3.35
Sheets, Galv., Pittsburgh..	4.80	4.80	4.80	4.80	3.55
Strip, H.R., Pittsburgh....	3.75-4.00	3.75-4.00	3.75-4.00	3.75-4.00	2.50
Strip, H.R., Chicago	3.50	3.50	3.50	3.50	2.50
Strip, C.R., Pittsburgh.....	4.65-5.35	4.65-5.35	4.65-5.35	4.65-5.35	3.20
Strip, C.R., Chicago	4.90	4.90	4.90	4.90	3.30
Strip, C.R., Detroit	4.85-5.60	4.85-5.60	4.85-5.60	4.35-5.60	3.35
Wire, Basic, Pittsburgh ...	4.85-5.10	4.85-5.10	4.85-5.10	4.85-5.10	3.425
Nails, Wire, Pittsburgh ...	5.90-6.20	5.90-6.20	5.90-6.20	5.90-6.20	4.125
Tin plate box, Pittsburgh..	$8.70	$8.70	$8.70	$8.70	$5.75

SEMIFINISHED

Billets, forging, Pitts.(NT)	$66.00	$66.00	$66.00	$66.00	$50.00
Wire rods, $\frac{7}{32}$-$\frac{7}{16}$", Pitts. ..	4.10-30	4.10-30	4.10-30	4.10-30	2.55

PIG IRON, Gross Ton

Bessemer, Pitts.	$53.00	$53.00	$53.00	$53.00	$34.00
Basic, Valley	52.00	52.00	52.00	52.00	33.00
Basic, del. Phila.	56.75	56.75	56.61	56.49	35.52
No. 2 Fdry, Pitts.	52.50	52.50	52.50	52.50	33.50
No. 2 Fdry, Chicago	52.50	52.50	52.50	52.50	33.00
No. 2 Fdry, Valley	52.50	52.50	52.50	52.50	33.50
No. 2 Fdry, del. Phila.	57.25	57.25	57.11	56.99	36.02
No. 2 Fdry, Birm.	48.88	48.88	48.88	48.88	29.88
No. 2 Fdry (Birm.) del. Cin.	55.49	55.49	55.49	55.33	34.75
Malleable, Valley	52.50	52.50	52.50	52.50	33.50
Malleable, Chicago	52.50	52.50	52.50	52.50	33.50
Charcoal, Lyles, Tenn.	66.00	66.00	66.00	66.00	40.50
Ferromanganese, Etna, Pa.	188.00	188.00	188.00	188.00	140.25*

* F.o.b. cars, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)

No. 1 Heavy Melt, Pitts....	$44.00	$44.00	$44.00	$45.00	$30.00
No. 1 Heavy Melt, E. Pa...	42.50	42.50	42.50	43.50	29.50
No 1 Heavy Melt, Chicago.	42.50	42.50	42.50	43.50	28.25
No. 1 Heavy Melt, Valley..	44.00	44.00	44.00	45.00	30.75
No. 1 Heavy Melt, Cleve...	43.00	43.00	43.00	44.00	30.75
No. 1 Heavy Melt, Buffalo.	43.00	43.00	43.00	44.00	32.00
Rails, Rerolling, Chicago ..	52.50	52.50	52.50	52.50	33.00
No. 1 Cast, Chicago	49.00*	49.00*	49.00*	49.00*	37.50

* F.o.b. shipping point.

COKE, Net Ton

Beehive, Furn, Connisvl. ..	$14.75	$14.75	$14.75	$14.75	$8.75-9.50
Beehive, Fdry, Connisvl. ..	17.50	17.50	17.50	17.50	9.75-11.00
Oven Fdry, Chicago	23.00	23.00	23.00	21.00	15.10

NONFERROUS METALS

Copper, del. Conn.	24.50	24.50	24.50	24.50	21.50-24.00
Zinc, E. St. Louis	19.50	19.50	19.50	17.50	10.50
Lead, St. Louis	14.80	14.80	18.80	16.80	14.80-14.85
Tin, New York	121.50	121.50	121.50	139.00	80.00
Aluminum, del.	19.00	19.00	19.00	19.00	15.00
Antimony, Laredo, Tex. ...	44.00	44.00	50.00	42.00	33.00
Nickel, refinery, duty paid.	56.50	56.50	56.50	50.50	35.00

PIG IRON

F.o.b. furnace prices quoted under GCPR as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem,Pa. B2	$54.00	$54.50	$55.00	$55.50
NewYork, del.	....	58.28	58.78	....
Newark, del.	57.02	57.52	58.02	58.52
Philadelphia, del.	56.75	57.25	57.75	58.25
Birmingham District				
Alabama City,Ala. R2	48.38	48.88	....	....
Birmingham R2	48.38	48.88	....	....
Birmingham S9	48.38	48.88	....	....
Woodward,Ala. W15	48.38	48.88	....	....
Cincinnati, del.	....	55.49	....	....
Buffalo District				
Buffalo R2	52.00	52.50	53.00	....
Buffalo H1	52.00	52.50	53.00	....
Tonawanda,N.Y. W12	52.00	52.50	53.00	....
No.Tonawanda,N.Y. T9	....	52.50	53.00	....
Boston, del.	62.11	62.61	63.11	....
Rochester,N.Y., del.	54.88	55.38	55.88	....
Syracuse,N.Y., del.	55.91	56.41	56.91	....
Chicago District				
Chicago I-3	52.00	52.50	52.50	53.00
Gary,Ind. U5	52.00	....	52.50	....
IndianaHarbor,Ind. I-2	52.00	....	52.50	....
So.Chicago,Ill. W14	52.00	52.50	52.50	....
So.Chicago,Ill. Y1	52.00	52.50	52.50	....
So.Chicago,Ill. U5	52.00	....	52.50	53.00
Milwaukee, del.	54.06	54.56	54.56	55.06
Muskegon,Mich., del.	....	58.47	58.47	....
Cleveland District				
Cleveland A7	52.00	52.50	52.50	53.00
Cleveland R2	52.00	52.50	52.50	....
Akron,O., del. from Cleve.	54.61	55.11	55.11	55.61
Lorain,O. N3	52.00	....	....	53.00
Duluth I-3	....	....	52.50	....
Erie,Pa. I-3	52.00	52.50	52.50	53.00
Everett, Mass. E1	....	59.75	60.25	....
Fontana,Calif. K1	58.00	58.50	....	....
Seattle,Tacoma,Wash., del.	....	60.66	....	....
Portland,Oreg., del.	....	60.66	....	....
LosAngeles,SanFrancisco, del. ...	60.16	60.66	....	....
GraniteCity,Ill. G4	53.90	54.40	54.90	....
St.Louis, del. (inc. tax).....	54.66	55.16	55.66	....
Ironton, Utah C11	52.00	52.50	....	....
Geneva,Utah C11	52.00	52.50	....	....
LoneStar,Tex. L6	48.00	*48.50	48.50	....
Minnequa,Colo. C10	54.00	55.00	55.00	....
Pittsburgh District				
NevilleIsland,Pa. P6	....	52.50	52.50	53.00
Pitts., N.&S. sides, Ambridge, Aliquippa, del.	....	53.80	53.80	54.30
McKeesRocks, del.	....	53.54	53.54	54.04
Lawrenceville, Homestead, McKeesport, Monaca, del.	....	54.07	54.07	54.57
Verona, del.	....	54.57	54.57	55.07
Brackenridge, del.	....	54.82	54.82	55.32
Bessemer,Pa. U5	52.00	....	52.50	53.00
Clairton,Rankin,So.Duquesne,Pa. U5	52.00	....	....	....
McKeesport,Pa. N3	52.00	....	....	53.00
Monessen,Pa. P7	54.00	....	....	....
Sharpsville,Pa. S6	....	....	52.50	53.00
Steelton,Pa. B2	54.00	54.50	55.00	55.50
Swedeland,Pa. A3	56.00	56.50	57.00	57.50
Toledo,O. I-3	52.00	52.50	52.50	53.00
Cincinnati, del.	57.47	57.97	....	....
Troy,N.Y. R2	54.00	54.50	55.00	55.50
Youngstown District				
Hubbard,O. Y1	52.00	52.50	52.50	....
Youngstown Y1	52.00	52.50	52.50	....
Youngstown U5	52.00	....	....	53.00
Mansfield,O., del.	56.65	57.15	57.15	57.65

* Low phos, southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50c manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson,O. G2, J1	$62.50
Buffalo H1	63.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for each 0.045% max. P)

NiagaraFalls,N.Y. P15	$88.00
Keokuk,Iowa, Openhearth & Fdry, frt. allowed K2	92.50
Keokuk, OH & Fdry., 12½ lb piglets, 16% Si, frt. allowed K2.	95.50
Wenatchee,Wash., O.H. & Fdry., frt. allowed K2.....	92.50

CHARCOAL PIG IRON, Gross Ton

(Low phos semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles,Tenn. T3	$66.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$57.00
Steelton,Pa. B2	60.00
Philadelphia delivered	63.55
Troy,N.Y. R2	60.00

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Semifinished and Finished Steel Products

Mill prices quoted under GCPR as reported to STEEL, May 22, 1952; cents per pound except as otherwise noted. Changes shown in Italics.
Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ....$79.00
Munhall,Pa. U5 .....52.00

INGOTS, Alloy (NT)
Detroit R7 .....$54.00
Fontana,Calif. K1 ....80.00
Houston S5 .....62.00
Midland,Pa. C18 .....54.00
Munhall,Pa. U5 .....54.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ....$56.00
Clairton,Pa. U5 .....56.00
Ensley,Ala. T2 .....56.00
Fairfield,Ala. T2 .....56.00
Fontana,Calif. K1 ....75.00
Gary,Ind. U5 .....56.00
Johnstown,Pa. B2 ....56.00
Lackawanna,N.Y. B2 ..56.00
Munhall,Pa. U5 .....56.00
So.Chicago,Ill. U5 ....56.00
So.Duquesne,Pa. U5 ...56.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$66.00
Buffalo R2 .....66.00
Canton,O. R2 .....66.00
Clairton,Pa. U5 .....66.00
Cleveland R2 .....66.00
Conshohocken,Pa. A3 ..73.00
Detroit R7 .....69.00
Ensley,Ala. T2 .....66.00
Fairfield,Ala. T2 .....66.00
Fontana,Calif. K1 ....85.00
Gary,Ind. U5 .....66.00
Geneva,Utah C11 .....66.00
Houston S5 .....74.00
Johnstown,Pa. B2 .....66.00
Lackawanna,N.Y. B2..66.00
LosAngeles B3 .....85.00
Munhall,Pa. U5 .....66.00
Seattle B3 .....85.00
So.Chicago R2,U5,W14.66.00
So.Duquesne,Pa. U5 ..66.00
So.SanFrancisco B3 ...85.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$70.00
Buffalo R2 .....70.00
Canton,O. R2 .....70.00
Canton,O.(29) T7 .....66.00
Conshohocken,Pa. A3 ..77.00
Detroit R7 .....73.00
Fontana,Calif. K1 ....89.00
Gary,Ind. U5 .....70.00
Houston S5 .....78.00
Ind.Harbor,Ind. Y1 ....70.00
Johnstown,Pa. B2 ....70.00
Lackawanna,N.Y. B2 ..70.00
LosAngeles B3 .....90.00
Massillon,O. R2 .....70.00
Midland,Pa. C18 .....70.00
Munhall,Pa. U5 .....70.00
So.Chicago R2,U5,W14.70.00
So.Duquesne,Pa. U5 ..70.00
Struthers,O. Y1 .....70.00
Warren,O. C17 .....70.00

ROUNDS, SEAMLESS TUBE (NT)
Canton,O. R2 .....$82.00
Cleveland R2 .....82.00
Fontana,Calif. K1 ...103.00
Gary,Ind. U5 .....82.00
Massillon,O. R2 .....82.00
So.Chicago, Ill. R2 ....82.00
So.Duquesne,Pa. U5 ..82.00

SHEET BARS (NT)
Fontana,Calif. K1 ...$89.00

SKELP
Aliquippa,Pa. J5 .....$3.45
Munhall,Pa. U5 .....3.35
Warren,O. R2 .....3.35
Youngstown R2, U5 ....3.35

WIRE RODS
Alton,Ill. L1 .....4.40
AlabamaCity,Ala. R2 ..4.10
Buffalo W12 .....4.10
Cleveland A7 .....4.10
Donora,Pa. A7 .....4.10
Fairfield,Ala. T2 .....4.10
Fontana,Calif. K1 ....4.90
Houston S5 .....4.50
Johnstown,Pa. B2 ....4.10
Joliet,Ill. A7 .....4.10
LosAngeles B3 .....4.90
Minnequa,Colo. C10 ....4.35
Monessen,Pa. P7 .....4.30
No.Tonawanda,N.Y. B11.4.10
Pittsburg,Calif. C11 ....4.75
Portsmouth,O. P12 ....4.30
Roebling,N.J. R5 .....4.20
So.Chicago,Ill. R2 .....4.10
SparrowsPoint,Md. B2 ..4.20
Sterling,Ill.(1) N15 ....4.10
Struthers,O. Y1 .....4.10
Torrance,Calif. C11 ....4.90
Worcester,Mass. A7 ....4.40

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ....4.45
Lackawanna,N.Y. B2 ..4.45
Munhall,Pa. U5 .....4.45
So.Chicago,Ill. U5 ....4.45

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ..3.60
Aliquippa,Pa. J5 .....3.65
Bessemer,Ala. T2 .....3.65
Bethlehem Pa. B2 .....3.70
Clairton,Pa. U5 .....3.65
Fairfield,Ala. T2 .....3.65
Fontana,Calif. K1 .....4.25
Gary,Ind. U5 .....3.65
Geneva,Utah C11 .....3.65
Houston, S5 .....4.05
Ind.Harbor,Ind. I-2 ...3.65
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 .....4.25
Lackawanna,N.Y. B2 ..3.70
LosAngeles B3 .....4.25
Minnequa,Colo. C10 ....4.10
Munhall,Pa. U5 .....3.65
Niles,Calif.(22) P1 ....4.85
Phoenixville,Pa. P4 ....5.90
Portland,Oreg. O4 .....4.50
Seattle B3 .....4.30
So.Chicago,Ill. U5 W14..3.65
So.SanFrancisco B3 ....4.20
Torrance,Calif. C11 ....4.25
Weirton,W.Va. W6 .....3.90

Alloy Stand. Shapes
Clairton,Pa. U5 .....4.35
Fontana,Calif. K1 .....5.55
Munhall,Pa. U5 .....4.35
So.Chicago,Ill. U5 ....4.35

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....5.50
Bessemer,Ala. T2 .....5.50
Bethlehem,Pa.(14) B2 ..5.50
Clairton,Pa. U5 .....5.50
Fairfield,Ala. T2 .....5.50
Fontana,Calif. K1 .....6.10
Gary,Ind. U5 .....5.50
Geneva,Utah C11 .....5.50
Ind.Harbor,Ind. I-2 ....5.50
Ind.Harbor,Ind. Y1 .....6.00
Johnstown,Pa. B2 .....5.50
Lackawanna,N.Y.(14)B2 5.50
LosAngeles B3 .....6.05
Munhall,Pa. U5 .....5.50
Seattle B3 .....6.10
So.Chicago,Ill. U5 .....5.50
So.SanFrancisco B3 ....6.00
Struthers,O. Y1 .....6.00

Wide Flange
Bethlehem,Pa. B2 .....3.70
Clairton,Pa. U5 .....3.65
Fontana,Calif. K1 .....4.65
Lackawanna,N.Y. B2 ..3.70
Munhall,Pa. U5 .....3.65
So.Chicago,Ill. U5 ....3.65

H.S., LA. Wide Flange
Aliquippa,Pa. J5 .....5.50
Lackawanna,N.Y. B2 ..5.50
Munhall,Pa. U5 .....5.45
So.Chicago,Ill. U5 ....5.45

BEARING PILES
Munhall,Pa. U5 .....2.65
So.Chicago,Ill. U5 .....3.65

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.65
Bessemer,Ala. T2 .....5.65
Clairton,Pa. U5 .....5.65
Cleveland J5, R2 .....5.65
Conshohocken,Pa. A3 ..5.90
Fairfield,Ala. T2 .....5.65
Fontana,Calif.(30) K1 ..6.25
Gary,Ind. U5 .....5.65
Geneva,Utah C11 .....5.65
Ind.Harbor,Ind. I-2 ....5.65
Ind.Harbor,Ind. Y1 .....6.15
Johnstown,Pa. B2 .....5.65
Munhall,Pa. U5 .....5.65
Pittsburgh J5 .....5.65
Seattle B3 .....6.55
Sharon,Pa. S3 .....5.70
So.Chicago,Ill. U5 .....5.65
SparrowsPoint,Md. B2 ..5.65
Warren,O. R2 .....5.65
Youngstown Y1 .....6.15

PLATES, Open-Hearth Alloy
Claymont,Del. C22 .....4.85
Coatesville,Pa. L7 .....5.25
Conshohocken,Pa. A3 ..5.05
Fontana,Calif. K1 .....5.70
Gary,Ind. U5 .....4.75
Johnstown,Pa. B2 .....4.75
Munhall,Pa. U5 .....4.75
Sharon,Pa. S3 .....5.20
So.Chicago,Ill. U5 .....4.75
SparrowsPoint,Md. B2 ..4.75

FLOOR PLATES
Cleveland J5 .....4.75
Conshohocken,Pa. A3 ....4.75
Ind.Harbor,Ind. I-2 ....4.75
Munhall,Pa. U5 .....4.75
So.Chicago,Ill. U5 .....4.75

PLATES, Ingot Iron
Ashland,c.l. (15) A10 ..3.95
Ashland,l.c.l. (15) A10 ..4.45
Cleveland,c.l. R2 .....4.30
Warren,O.c.l. R2 .....4.30

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..3.70
Aliquippa,Pa. J5 .....3.70
Ashland,Ky. (15) A10 ..3.70
Bessemer,Ala. T2 .....3.70
Clairton,Pa. U5 .....3.70
Claymont,Del. C22 .....4.15
Cleveland J5, R2 .....3.70
Coatesville,Pa. L7 .....4.15
Conshohocken,Pa. A3 ..4.15
Fairfield,Ala. T2 .....3.70
Fontana,Calif.(30) K1 ..4.30
Gary,Ind. U5 .....3.70
GraniteCity,Ill. G4 .....4.40
Geneva,Utah C11 .....3.70
Harrisburg,Pa. C5 .....6.30
Houston S5 .....4.10
Ind.Harbor,Ind. I-2, Y1.3.70
Johnstown,Pa. B2 .....3.70
Lackawanna,N.Y. B2 ..3.70
Minnequa,Colo. C10 ....4.50
Munhall,Pa. U5 .....3.70
Pittsburgh J5 .....3.70
Seattle B3 .....4.60
Sharon,Pa. S3 .....3.95
So.Chicago,Ill. U5 W14..3.70
SparrowsPoint,Md. B2 ..3.70
Steubenville,O. W10 ....3.70
Warren,O. R2 .....3.70
Weirton,W.Va. W6 .....4.90
Youngstown R2, U5, Y1.3.70

PLATES, Carbon A.R.
Fontana,Calif. K1 .....5.45
Geneva,Utah C11 .....4.85

PLATES, Wrought Iron
Economy,Pa. B14 .....9.60

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ..3.70
Aliquippa,Pa. J5 .....3.70
Alton,Ill. L1 .....4.15
Atlanta,Ga. A11 .....4.25
Bessemer,Ala. T2 .....3.70
Buffalo R2 .....3.70
Canton,O. R2 .....3.70
Clairton,Pa. U5 .....3.70
Cleveland R2 .....3.70
Detroit R7 .....3.85
Emeryville,Calif. J7 ....4.45
Fairfield,Ala. T2 .....3.70
Fontana,Calif. K1 .....4.40
Gary,Ind. U5 .....3.70
Houston S5 .....4.10
Ind.Harbor,Ind. I-2, Y1.3.70
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 .....4.30
Lackawanna,N.Y. B2 ..3.70
LosAngeles B3 .....4.40
Milton,Pa. B6 .....4.55
Minnequa,Colo. C10 ....4.15
Niles,Calif. P1 .....5.05
N.Tonawanda,N.Y. B11..3.70
Pittsburg,Calif. C11 ....4.40
Pittsburgh J5 .....3.70
Portland,Oreg. O4 .....4.65
Seattle B3, N14 .....4.45
Struthers,O. Y1 .....3.70
Torrance,Calif. C11 .....4.40
Weirton,W.Va. W6 .....3.85
So.Chicago R2, U5, W14..3.70
So.Duquesne,Pa. U5 ....3.70
So.SanFran.,Cal. B3 ....4.45
Youngstown R2, U5 ....3.70

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....3.70
Atlanta A11 .....4.25
Johnstown,Pa. B2 .....3.70
Lackawanna,N.Y. B2 ..3.70
Niles,Calif. P1 .....5.05
Portland,Oreg. O4 .....4.65
SanFrancisco S7 .....4.85

BAR SIZE ANGLES; H.R.CARBON
Bethlehem,Pa. B2 .....3.90

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 .....4.30
Buffalo R2 .....4.30
Canton,O. R2 .....4.30
Canton,O.(29) T7 .....3.95
Clairton,Pa. U5 .....4.30
Detroit R7 .....4.45
Ecorse,Mich. G5 .....4.65
Fontana,Calif. K1 .....5.35
Gary,Ind. U5 .....4.30
Houston S5 .....4.70
Ind.Harbor,Ind. I-2, Y1.4.30
Johnstown,Pa. B2 .....4.30
KansasCity,Mo. S5 .....4.90
Lackawanna,N.Y. B2 ..4.30
LosAngeles B3 .....5.35
Massillon,O. R2 .....4.30
Midland,Pa. C18 .....4.30
So.Chicago R2, U5, W14.4.30
So.Duquesne,Pa. U5 ....4.30
Struthers,O. Y1 .....4.30
Warren,O. C17 .....4.30
Youngstown U5 .....4.30

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....4.55
Gary,Ind. U5 .....4.55
Youngstown U5 .....4.55

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.55
Bessemer,Ala. T2 .....5.55
Bethlehem,Pa. B2 .....5.55
Clairton,Pa. U5 .....5.55
Cleveland R2 .....5.55
Fairfield,Ala. T2 .....5.55
Fontana,Calif. K1 .....6.40
Gary,Ind. U5 .....5.55
Ind.Harbor,Ind. I-2 ....5.55
IndianaHarbor,Ind. Y1 ..6.05
Johnstown,Pa. B2 .....5.55
Lackawanna,N.Y. B2 ...5.55
LosAngeles B3 .....6.25
Pittsburgh J5 .....5.55
Seattle B3 .....6.30
So.Duquesne,Pa. U5 ....5.55
So.SanFrancisco B3 ....6.30
Struthers,O. Y1 .....6.05
Youngstown U5 .....5.55

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 .....4.55
BeaverFalls,Pa. M12, R2 4.55
Buffalo B5 .....4.60
Camden,N.J. P13 .....5.00
Carnegie,Pa. C12 .....4.55
Chicago W18 .....4.55
Cleveland A7, C20 .....4.55
Detroit P17 .....4.70
Donora,Pa. A7 .....4.55
Elyria,O. W8 .....4.55
FranklinPark,Ill. N5 ....4.55
Gary,Ind. R2 .....4.55
GreenBay,Wis. F7 .....4.55
Hammond,Ind. L2, M13.4.55
Hartford,Conn. R2 .....5.10
Harvey,Ill. B5 .....4.55
LosAngeles R2 .....6.00
Mansfield,Mass. B5 .....5.10
Massillon,O. R2, R8 ....4.55
Monaca,Pa. S17 .....4.55
Newark,N.J. W18 .....5.00
Plymouth,Mich. P5 .....4.80
Pittsburgh J5 .....4.55
Putnam,Conn. W18 .....5.10
Readville,Mass. C14 .....5.10
St.Louis,Mo. M5 .....4.95
So.Chicago,Ill. W14 ....4.55
SpringCity,Pa.(5) K3 ...5.00
Struthers,O. Y1 .....4.55
Waukegan,Ill. A7 .....4.55
Youngstown F3, Y1 ....4.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 .....5.40
BeaverFalls,Pa. M12 ....5.40
Bethlehem,Pa B2 .....5.40
Buffalo B5 .....5.40
Camden,N.J. P13 .....5.80
Canton,O. R2 .....5.40
Canton,O(29) T7 .....4.90
Carnegie,Pa. C12 .....5.40
Chicago W18 .....5.40
Cleveland A7 .....5.45
Cleveland C20 .....5.40
Detroit P17 .....5.55
Donora,Pa. A7 .....5.45
Elyria,O. W8 .....5.40
Gary,Ind. R2 .....5.40
Hammond,Ind. L2, M13 .5.40
Hartford,Conn. R2 .....5.85
Harvey,Ill. B5 .....5.40
Lackawanna,N.Y. B2 ....5.40
Mansfield,Mass. B5 ....5.85
Massillon,O. R2, R8 ....5.40
Midland,Pa. C18 .....5.40
Monaca,Pa. S17 .....5.40
Newark,N.J. W18 .....5.75
Plymouth,Mich. P5 .....5.60
So.Chicago,Ill. R2, W14.5.40
Struthers,O. Y1 .....5.40
Warren,O. C17 .....5.40
Waukegan,Ill. A7 .....5.45
Worcester,Mass. A7 ....5.75
Youngstown F3, Y1 ....5.40

RAIL STEEL BARS
ChicagoHts.(3,4) C2 ....4.75
Chicago Hts.(3,4) I-2 ...4.75
Franklin,Pa.(3,4) F5 ...4.75
FortWorth,Tex.(26) T4..4.85
Huntngtn,W.Va.(3) W7 .5.50
Marion,O.(3) P11 .....4.75
Moline,Ill.(3) R2 .....3.80
Tonawanda(3,4) B12 ....4.75
Williamsport(3) S19 ....5.00
Williamsport(4) S19 ....5.10

BARS, Wrought Iron
Dover,N.J.(Staybolt)U1 15.00
Dover(Eng.Bolt) U1 ..13.50
Dover(Wrght.Iron) U1 .12.25
Economy,Pa.(S.R.) B14..9.60
Economy,Pa.(D.R.)B14 11.90
Economy(Staybolt) B14 12.20
McK.Rks.(Staybolt)L5 .14.50
McK.Rks.(S.R.) L5 ....9.60
McK.Rks.(D.R.) L5 ...13.00

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ...3.70
Atlanta A11 .....4.25
Buffalo R2 .....3.70
Cleveland R2 .....3.70
Emeryville,Calif. J7 ....4.45
Fairfield,Ala. T2 .....3.70
Fontana,Calif. K1 .....4.40
Gary,Ind. U5 .....3.70
Houston S5 .....4.40
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 .....4.30
LosAngeles B3 .....4.40
Milton,Pa. B6 .....4.55
Minnequa,Colo. C10 ....4.15
Monaca,Pa. S17 .....4.40
Newark,N.J. W18 .....4.55
Niles,Calif. P1 .....5.05
Pittsburg,Calif. C11 ....4.30
Pittsburgh J5 .....3.60
Sharon,Pa. S3 .....4.00
So.Chicago,Ill. W14 ....3.60
SparrowsPoint,Md. B2 ..3.60
Steubenville,O. W10 ....3.60
Torrance,Calif. C11 ....4.30
Warren,O. R2 .....3.60
Weirton,W.Va. W6 .....3.60
WestLeechburg,Pa. A4 ..3.75
Youngstown U5, Y1 ....3.60

SHEETS, H.R. (19 gage)
AlabamaCity,Ala. R2 ..4.75
Dover,O. R1 .....5.65
Ind.Harbor,Ind. I-2 .....5.40
Mansfield,O. E6 .....5.65
Niles,O. N12 .....5.75
Torrance,Calif. C11 .....5.40

SHEETS, H.R. (14 ga., heavier)
High-Strength Low-Alloy
Cleveland J5, R2 .....5.40
Conshohocken,Pa. A3 ...5.65
Ecorse,Mich. G5 .....5.95
Fairfield,Ala. T2 .....5.40
Fontana,Calif. K1 .....6.35
Gary,Ind. U5 .....5.40
Ind.Harbor,Ind. I-2 .....5.40
Ind.Harbor,Ind. Y1 .....5.90
Irvin,Pa. U5 .....5.40
Lackawanna(35) B2 .....5.40
Pittsburgh J5 .....5.40
Sharon,Pa. S3 .....5.40
So.Chicago,Ill. U5 .....5.40
SparrowsPoint(36) B2 ..5.40
Warren,O. R2 .....5.40
Weirton,W.Va. W6 .....5.75
Youngstown U5 .....5.40
Youngstown Y1 .....5.90

SHEETS, Cold-Rolled
High-Strength Low-Alloy
Cleveland J5, R2 .....6.65
Ecorse,Mich. G5 .....7.10
Fontana,Calif. K1 .....7.50
Gary,Ind. U5 .....6.55
IndianaHarbor,Ind. Y1..7.05
IndianaHarbor,Ind. I-2..6.55
Irvin,Pa. U5 .....6.55
Lackawanna(37) B2 ....6.55
Pittsburgh J5 .....6.55
SparrowsPoint(38) B2 ..6.55
Warren,O. R2 .....6.55
Weirton,W.Va. W6 .....6.90
Youngstown Y1 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.35
Cleveland J5, R2	4.35
Ecorse,Mich. G5	4.55
Fairfield,Ala. T2	4.35
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	5.30
Gary,Ind. U5	4.35
GraniteCity,Ill. G4	5.05
Ind.Harbor,Ind. I-2, Y1	4.35
Irvin,Pa. U5	4.35
Lackawanna,N.Y. B2	4.35
Middletown,O. A10	4.35
Pittsburg,Calif. C11	5.30
Pittsburgh J5	4.35
SparrowsPoint,Md. B2	4.35
Steubenville,O. W10	4.35
Warren,O. R2	4.35
Weirton,W.Va. W6	4.35
Youngstown Y1	4.35

SHEETS, Gal'd No. 10 Steel

AlabamaCity,Ala. R2	4.80
Ashland,Ky.(8) A10	4.80
Canton,O. R2	4.80
Dover,O. R1	5.50
Fairfield,Ala. T2	4.80
Gary,Ind. U5	4.80
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. I-2	4.80
Irvin,Pa. U5	4.80
Kokomo,Ind.(13) C16	5.20
MartinsFerry,O. W10	4.80
Niles,O. N12	6.00
Pittsburg,Calif. C11	5.55
SparrowsPoint,Md. B2	4.80
Steubenville,O. W10	4.80
Torrance,Calif. C11	5.55
Weirton,W.Va. W6	4.80

SHEETS, Galvanized No. 10, High-Strength Low-Alloy

Irvin,Pa. U5	7.20
SparrowsPoint(39) B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	5.35
Irvin,Pa. U5	5.35
Kokomo,Ind.(13) C16	5.75
Niles,O. N12	6.55

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	5.05
Middletown,O. A10	5.05

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.65
Niles,O. R2 (28)	5.65
Weirton,W.Va. W6	5.50

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.70

SHEETS, Drum Body

Pittsburg,Calif. C11	4.30
Torrance,Calif. C11	4.30

SHEETS, Well Casing

Fontana,Calif. K1	5.10

BLUED Stock, 29 ga.

Yorkville,O. W10	6.80
Follansbee,W.Va.(23)F4	6.85

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.65
Cleveland R2	4.65
Gary,Ind. U5	4.65
GraniteCity,Ill. G4	5.35
Ind.Harbor,Ind. I-2	4.65
Irvin,Pa. U5	4.65
Middletown,O. A10	4.65
Youngstown Y1	4.65

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.25
Fairfield,Ala. T2	6.35
Gary,Ind. U5	6.25
GraniteCity,Ill. G4	6.45
Ind.Harbor,Ind. I-2, Y1	6.25
Irvin,Pa. U5	6.25
Niles,O. R2	6.25
Pittsburg,Calif. C11	7.00
SparrowsPoint,Md. B2	6.35
Warren,O. R2	6.25
Weirton,W.Va. W6	6.25
Yorkville,O. W10	6.25

HOLLOWWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	5.85
Gary,Ind. U5	5.85
GraniteCity,Ill. G4	6.05
Ind.Harbor,Ind. Y1	5.85
Irvin,Pa. U5	5.85
Yorkville,O. W10	6.15

SHEETS, Culvert No. 16

	Cu Alloy	Cu Fe
Ashland,Ky. A10	5.60	...
Canton,O. R2	5.65	6.10
Fairfield,Ala. T2	5.60	5.85
Gary,Ind. U5	5.60	5.85
IndianaHarbor I-2	5.60	5.85
Irvin,Pa. U5	5.60	5.85
Kokomo,Ind. C16	6.25	...
MartinsFy,O. W10	5.60	5.85
Pittsburg,Cal. C11	6.35	...
SparrowsPt. B2	5.60	...
Torrance,Cal. C11	6.35	...

SHEETS, Culvert, No. 16 Pure Iron

Ashland,Ky. A10	5.85
Fairfield,Ala. T2	5.85

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	3.85
Cleveland R2	4.20
Ind.Harbor,Ind. I-2	3.85
Warren,O. R2	4.20

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	4.95
Middletown,O. A10	4.85
Warren,O. R2	4.95

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	5.05
Canton,O. R2	5.55

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.30
Middletown,O. A10	5.30

SHEETS, ALUMINIZED

Butler,Pa. A10	8.15

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.15	$7.40	$7.80
Fairfield,Ala. T2	7.25	7.50	7.90
Gary,Ind. U5	7.15	7.40	7.80
GraniteCity,Ill. G4	7.35	7.60	8.00
Ind.Harbor,Ind. I-2, Y1	7.15	7.40	7.80
Irvin,Pa. U5	7.15	7.40	7.80
Niles,O. R2	7.15	7.40	7.80
Pittsburg,Calif. C11	7.90	8.15	8.55
SparrowsPoint,Md. B2	7.25	7.50	7.90
Weirton,W.Va. W6	7.15	7.40	7.80
Yorkville,O. W10	7.15	7.40	7.80

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut Lengths ½c lower)

	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
BeechBottom W10 (cut lengths)	...	...	7.25	8.50	9.30
Brackenridge,Pa. A4	...	...	7.75	9.00	9.80
GraniteCity,Ill. G4 (cut lengths)	...	...	7.95	9.20	...
Ind.Harbor,Ind. I-2	6.95	7.25	(34)	...	...
Mansfield,O. E6 (cut lengths)	7.10	7.25	7.75	9.00	9.80
Niles,O. N12 (cut lengths)	...	6.75	7.25	...	...
Vandergrift,Pa. U5	...	7.25	7.75	9.00	9.80
Warren,O. R2	6.95	7.25	7.75	9.00	9.80
Zanesville,O. A10	...	7.25	7.75	9.00	9.80

SHEETS, SILICON (22 Ga. Base) Coils (Cut Lengths ½c lower)

Transformer Grade	72	65	58	52
BeechBottom W10 (cut lengths)	9.85	10.40	11.10	11.90
Brackenridge,Pa. A4	10.35	....	....	....
Vandergrift,Pa. U5	10.35	10.90	11.60	12.40
Warren,O. R2	10.35	....	....	....
Zanesville,O. A10	10.35	10.90	11.60	12.40

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	....	....	14.75	15.25
Vandergrift,Pa. U5	12.90	13.75	14.75	15.25

TINPLATE, American Coke (Base Box)

	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.45	$8.70
Fairfield,Ala. T2	8.55	8.80
Gary,Ind. U5	8.45	8.70
Ind.Har. I-2, Y1	8.45	8.70
Irvin,Pa. U5	8.45	8.70
Pitts.,Cal. C11	9.20	9.45
Sp.Pt.,Md. B2	8.55	8.80
Warren,O. R2	8.45	8.70
Weirton,W.Va.W6	8.45	8.70
Yorkville,O. W10	8.45	8.70

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.60
Gary,Ind. U5	7.50
Irvin,Pa. U5	7.50
SparrowsPoint,Md. B2	7.60
Yorkville,O. W10	7.50

SHEETS, LT. Coated Ternes, 6 lb

Yorkville,O. W10	$8.40

SHEET, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5	$9.50
Yorkville,O. W10	9.50

SHEET, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va.W10	5.20
Gary,Ind. U5	5.20
Mansfield,O. E6	6.05
Middletown,O. A10	5.20
Niles,O. N12	6.00
Weirton,W.Va. W6	5.20

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.60

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.50

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	5.30
Conshohocken,Pa. A3	5.55
Ecorse,Mich. G5	5.95
Fairfield,Ala. T2	5.30
Fontana,Calif. K1	6.20
Gary,Ind. U5	5.30
Ind.Harb.,Ind. I-2	5.30
IndianaHarbor,Ind. Y1	5.80
Lackawanna,N.Y. B2	4.95
LosAngeles(25) B3	6.05
Seattle B3	6.30
Sharon,Pa. S3	5.40
So.SanFrancisco(25) B3	6.05
SparrowsPoint,Md. B2	4.95
Warren,O. R2	5.30
Weirton,W.Va. W6	5.75
Youngstown Y1	5.80
Youngstown U5	5.30

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland J5	6.70
Cleveland A7	6.55
Dover,O. G6	7.30
Fontana,Calif. K1	6.95
Lackawanna,N.Y. B2	6.40
Sharon,Pa. S3	6.55
SparrowsPoint,Md. B2	6.40
Warren,O. R2	6.55
Weirton,W.Va. W6	7.20
Youngstown Y1	7.05

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.50
Alton,Ill. L1	3.95
Ashland,Ky.(8) A10	3.50
Atlanta A11	4.05
Bessemer,Ala. T2	3.50
Bridgeprt,Conn.(10) S15	4.00
Buffalo(27) R2	3.50
Butler,Pa. A10	3.50
Carnegie,Pa. S18	4.00
Conshohocken,Pa. A3	3.90
Detroit M1	4.40
Ecorse,Mich. G5	3.80
Fairfield,Ala. T2	3.50
Fontana,Calif. K1	4.75
Gary,Ind. U5	3.50
Houston,Tex. S5	4.90
Ind.Harbor,Ind. I-2, Y1	3.50
Johnstown,Pa.(25) B2	3.50
KansasCity,Mo.(9) S5	4.10
Lackawanna,N.Y.(32)B2	3.50
LosAngeles B3	4.25
Milton,Pa. B6	4.35
Minnequa,Colo. C10	4.55
NewBritain(10) S15	4.00
No.Tonawanda,N.Y. B11	3.50
Pittsburg,Calif. C11	4.25
Riverdale,Ill. A1	3.50
SanFrancisco S7	4.85
Seattle B3, N14	4.50
Sharon,Pa. S3	4.00
So.Chicago,Ill. W14	3.50
SoSanFrancisco B3	4.25
SparrowsPoint,Md. B2	3.50
Torrance,Calif. C11	4.25
Warren,O. R2	3.50
Weirton,W.Va. W6	3.60
WestLeechburg,Pa. A4	3.75
Youngstown U5, Y1	3.50

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10) S15	5.45
Carnegie,Pa. S18	5.85
Fontana,Calif. K1	6.70
Gary,Ind. U5	5.50
Houston,Tex. S5	5.90
KansasCity,Mo. S5	6.10
Midland,Pa. C18	5.85
NewBritn,Conn.(10) S15	5.45
Sharon,Pa. S3	5.85
Youngstown U5	5.50

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.50
Berea,O. C7	6.60
Bridgeprt,Conn.(10) S15	5.35
Butler,Pa. A10	4.65
Cleveland A7, J5	4.65
Dearborn,Mich. D3	5.60
Detroit D2	5.60
Detroit M1	5.45
Dover,O.(40) G6	5.50
Ecorse,Mich. G5	4.85
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	6.30
FranklinPark,Ill.(40)T6	4.90
Ind.Harbor,Ind. I-2	4.90
Lackawanna,N.Y. B2	4.65
LosAngeles C1	6.40
Mattapan,Mass. T6	5.50
Middletown,O. A10	4.65
NewBritain(10) S15	5.35
NewCastle,Pa. B4	5.35
NewCastle,Pa.(40) E5	5.25
NewHaven,Conn. D2	5.85
NewHaven,Conn. A7	5.15
Pawtucket,R.I. R3	6.00
Pawtucket,R.I.(21) N8	5.85
Riverdale,Ill.(40) A1	4.90
Rome,N.Y. R6	5.10
Sharon,Pa. S3	5.35
SparrowsPoint,Md. B2	4.65
Trenton,N.J. R5	6.00
Wallingford,Conn. W2	5.85
Warren,O.(40) T5	5.25
Warren,O. R2	4.65
Weirton,W.Va. W6	4.65
Youngstown C8 (40)	5.25
Youngstown Y1	4.65

STRIP, Electro Galvanized

Dover,O. G6	5.50
Warren,O. T5	5.25
Weirton,W.Va. W6	4.65
Youngstown C8	5.25

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7	...	6.80	7.40	9.35	11.65
Bridgeport,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
Bristol,Conn. W1	...	...	7.70	9.65	....
Carnegie,Pa. S18	...	6.80	7.40	9.35	11.65
Cleveland A7	4.65	6.45	7.40	9.35	11.65
Dearborn,Mich. D3	5.60	7.05	7.65	...	....
Detroit D2	5.60	6.65	7.25	...	....
Dover,O. G6	5.50	6.80	7.40	9.35	11.65
FranklinPark,Ill. T6	5.00	6.60	7.55	9.50	11.80
Harrison,N. J. C18	...	...	7.70	9.65	11.95
Mattapan,Mass. T6	5.50	6.75	7.70	9.65	11.95
NewBritn.,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
NewCastle,Pa. B4	5.35	6.80	7.40	9.35	....
NewCastle,Pa. E5	5.50	6.80	7.40	9.35	11.65
NewHaven,Conn. D2	5.85	6.75	7.35	...	....
NewYork W3	...	7.10	7.70	9.65	11.95
Pawtucket,R.I. N8:					
Cleve.orPitts.Base	...	6.80	7.40	9.35	11.65
Worcester,Mass.,Base	5.85	7.10	7.70	9.65	11.95
Sharon,Pa. S3	5.35	6.80	7.40	9.35	11.65
Trenton,N.J. R5	...	7.10	7.70	9.65	11.95
Wallingford,Conn. W2	5.85	6.75	7.35	9.30	11.60
Weirton,W.Va. W6	5.35	6.80	7.40	9.35	11.65
Worcester,Mass. A7	4.95	6.75	7.70	9.65	11.95
Worcester,Mass. T6	5.50	6.75	7.70	9.65	11.95
Youngstown C8	...	6.80	7.40	9.35	11.65
Spring Steel (Tempered)					
Trenton,N.J. R5	...	...	10.30	12.50	15.35
Harrison,N.J. C18	...	...	10.30	12.50	15.35
New York W3	...	...	10.30	12.50	15.35

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 Armco Cladmetals Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Boiardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B12 Buffalo Steel Co.
B14 A. M. Byers Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Corp.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
H1 Hanna Furnace Corp.
I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div. Borg-Warner Corp.
I-7 Indiana Steel & Wire Co.
J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.
K1 Kaiser Steel Corp.
K2 Keokuk Electro Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10)S15	10.75
Carnegie,Pa. S18	10.60
Cleveland A7	10.00
Dover,O. G6	10.50
Fontana,Calif. K1	11.65
Harrison,N.J. C18	10.60
Midland,Pa. C18	10.60
NewBritn,Conn.(10)S15	10.75
Pawtucket,R.I.(11) N8	10.75
Pawtucket,R.I.(12) N8	11.05
Sharon,Pa. S3	10.60
Worcester,Mass. A7	10.30
Youngstown C8	10.60

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.75
Warren,O. R2	4.10

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	5.25

TIGHT COOPERAGE HOOP

Atlanta A11	4.05
Riverdale,Ill. A1	3.90
Sharon,Pa. S3	4.15
Youngstown U5	3.75

WIRE, Tire Bead

Bartonville,Ill.(1) K4	10.90
Monessen,Pa. P16	11.40
Roebling,N.J. R5	11.55

WIRE, Merchant Quality

(6 to 8 gage)	An'ld	Galv.
AlabamaCity,Ala. R2	5.70	5.95
Aliquippa J5	5.70	6.15
Atlanta A11	5.95	6.40
Bartonville(19)K4	5.70	6.15
Buffalo W12	4.85	...
Cleveland A7	5.70	6.15
Crawfordsville M8	5.95	6.40
Donora,Pa. A7	5.70	6.15
Duluth,Minn. A7	5.70	6.15
Fairfield T2	5.70	6.15
Houston,Tex. S5	6.10	6.55
Johnstown B2	5.70	6.15
Joliet,Ill. A7	5.70	6.15
KansasCy,Mo. S5	6.30	6.75
Kokomo C16	5.80	6.05
LosAngeles B3	6.65	...
Minnequa C10	5.95	6.45
Monessen P7	5.95	6.40
Palmer W12	5.15	...
Pitts.,Calif. C11	6.65	6.80
Prtsmth.(18)P12	6.10	6.60
Rankin A7	5.70	6.15
So.Chicago R2	5.70	5.95
So.S.Fran. C10	6.65	7.10
SparrowsPt, B2	5.80	6.25
Sterling,Ill.(1)N15	5.70	6.15
Struthers,O. Y1	5.70	6.15
Torrance,Cal. C11	6.65	...
Worcester A7	6.00	6.45

ROPE WIRE

	(A)	(B)
Alton,Ill. L1	8.65	8.90
Bartonville,Ill. K4	8.55	8.80
Buffalo W12	8.55	8.80
Fostoria,O. S1	8.85	9.10
Johnstown,Pa. B2	8.55	8.80
Monessen,Pa. P16	8.55	8.80
Monessen,Pa. P7	8.80	9.05
Muncie,Ind. I-7	8.75	9.00
Palmer,Mass.W12	8.85	9.10
Portsmouth,O.P12	8.55	8.80
Roebling,N.J. R5	8.85	9.10
SparrowsPt, B2	8.65	8.90
Struthers,O. Y1	8.55	8.80
Worcester J4, T6	8.85	9.10

(A) Plow and Mild Plow
(B) Improved Plow.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	4.85
Aliquippa,Pa. J5	4.85
Atlanta A11	5.10
Alton,Ill. L1	5.05
Bartonville,Ill.(1) K4	4.85
Buffalo W12	4.85
Chicago W13	5.10
Cleveland A7, C20	4.85
Crawfordsville,Ind. M8	5.10
Donora,Pa. A7	4.85
Duluth,Minn. A7	4.85
Fairfield,Ala. T2	4.85
Fostoria,O.(24) S1	5.35
Houston S5	5.25
Johnstown,Pa. B2	4.85
Joliet,Ill. A7	4.85
KansasCity,Mo. S5	5.45
Kokomo,Ind. C16	4.95
LosAngeles B3	5.80
Minnequa,Colo. C10	5.10
Monessen,Pa. P7	5.10
Newark 6-8 ga. I-1	5.50
No.Tonawanda B11	4.85
Palmer,Mass. W12	5.15
Pittsburg,Calif. C11	5.80
Portsmouth,O. P12	5.25
Rankin,Pa. A7	4.85
So.Chicago,Ill. R2	4.85
So.SanFrancisco C10	5.80
SparrowsPoint,Md. B2	4.95
Sterling,Ill.(1) N15	4.85
Struthers,O. Y1	4.85
Torrance,Calif. C11	5.80
Waukegan,Ill. A7	4.85
Worcester,Mass. A7, T6	5.15

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	6.20
Buffalo W12	6.35
Cleveland A7	5.85
Crawfordsville,Ind. M8	6.20
Detroit D2	6.20
Dover,O. G6	6.20
Fostoria,O. S1	6.00
Kokomo,Ind. C16	5.70
FranklinPark,Ill. T6	6.20
Massillon,O. R8	5.85
Monessen,Pa. P16	5.85
Monessen,Pa. P7	6.10
NewHaven,Conn. D2	6.50
Pawtucket,R.I.(12) N8	6.85
Trenton,N.J. R5	6.15
Worcester,Mass. A7	6.15
Worcester,Mass. T6	6.50
Worcester,Mass. W12	6.65

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	8.50
Monessen,Pa. P16	8.50
Muncie,Ind. I-7	8.70
Roebling,N.J. R5	8.80
SparrowsPoint,Md. B2	8.60
Johnstown,Pa. B2	8.50

WIRE (16 gage)	An'ld Stone	Galv. Stone
Aliquippa J5	10.15	12.15
Bartonville(1)K4	10.25	11.95
Cleveland A7	10.25	12.15
Crawfrdsville M8	10.30	12.00
Fostoria,O. S1	10.40	13.00
Johnstown B2	10.25	12.15
Kokomo C16	10.25	11.95
Minnequa C10	10.40	12.40
Palmer,Mass.W12	10.25	12.15
Pitts.Cal. C11	10.60	12.50
Prtsmth.(18) P12	10.55	12.30
SparrowsPt, B2	10.35	12.25
Waukegan A7	10.25	12.15

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	6.25
Alton,Ill. L1	6.45
Bartonville,Ill.(1) K4	6.25
Buffalo W12	6.25
Cleveland A7	6.25
Donora,Pa. A7	6.25
Duluth,Minn. A7	6.25
Fostoria,O. S1	6.25
Johnstown,Pa. B2	6.25
LosAngeles B3	7.20
Milbury,Mass.(12) N6	8.05
Monessen,Pa. P7, P16	6.25
Muncie,Ind. I-7	6.45
Palmer,Mass. W12	6.55
Pittsburg,Calif. C11	7.20
Roebling,N.J. R5	6.55
Portsmouth,O. P12	6.25
So.Chicago,Ill. R2	6.25
So.SanFrancisco C10	7.20
SparrowsPoint,Md. B2	6.35
Struthers,O Y1	6.25
Trenton,N.J. A7	6.55
Waukegan,Ill. A7	6.25
Worcester A7, T6, W12	6.55
Worcester,Mass. J4	6.75

WIRE, Fine & Weaving (8"Coils)

Bartonville,Ill.(1) K4	8.90
Buffalo W12	8.90
Chicago W13	8.90
Cleveland A7	8.90
Crawfordsville,Ind. M8	8.95
Fostoria,O. S1	8.90
Johnstown,Pa. B2	8.90
Kokomo,Ind. C16	8.90
Monessen,Pa. P16	8.90
Muncie,Ind. I-7	9.10
Palmer,Mass. W12	9.20
Portsmouth,O. P12	8.90
Roebling,N.J. R5	9.20
Waukegan,Ill. A7	8.90
Worcester,Mass. A7, T6	9.20

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	137
Aliquippa,Pa. J5	141
Atlanta A11	144
Bartonville,Ill.(19) K4	144
Crawfordsville,Ind. M8	146
Donora,Pa. A7	141
Duluth,Minn. A7	141
Fairfield,Ala. T2	141
Houston,Tex. S5	149
Johnstown,Pa. B2	141
Joliet,Ill. A7	141
KansasCity,Mo. S5	153
Kokomo,Ind. C16	143
Minnequa,Colo. C10	147
Monessen,Pa. P7	146
Pittsburg,Calif. C11	161
Portsmouth,O.(18) P12	148
Rankin,Pa. A7	141
So.Chicago,Ill. R2	137
So.SanFran.,Calif. C10	161
SparrowsPoint,Md. B2	143
Sterling,Ill.(1) N15	141

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	123
Atlanta A11	126
Bartonville,Ill.(19) K4	123
Crawfordsville,Ind. M8	132
Donora,Pa. A7	123
Duluth,Minn. A7	123
Fairfield,Ala. T2	123
Joliet,Ill. A7	123
KansasCity,Mo. S5	135
Kokomo,Ind. C16	125
Minnequa,Colo. C10	128
Pittsburg,Calif. C11	147
So.Chicago,Ill. R2	123
So.SanFran.,Calif. C10	147
SparrowsPoint,Md. B2	125
Sterling,Ill.(1) N15	123

WIRE, Upholstery Spring

Aliquippa,Pa. J5	5.90
Alton,Ill. L1	6.10
Buffalo W12	5.90
Cleveland A7	5.90
Donora,Pa. A7	5.90
Duluth,Minn. A7	5.90
Johnstown,Pa. B2	5.90
LosAngeles B3	6.85
Monessen,Pa. P7, P16	5.90
NewHaven,Conn. A7	6.20
Palmer,Mass. W12	6.20
Pittsburg,Calif. C11	6.85
Portsmouth,O. P12	5.90
Roebling,N.J. R5	6.20
So.Chicago,Ill. R2	5.90
So.SanFrancisco C10	6.85
SparrowsPoint,Md. B2	6.00
Torrance,Calif. C11	6.85
Trenton,N.J. A7	6.20
Waukegan,Ill. A7	5.90
Worcester,Mass. A7	6.20

WOVEN FENCE, 9-15½ Ga.

	Col.
AlabamaCity,Ala. R2	127
Ala.City,Ala.,17-18ga.R2	214
Aliquippa,Pa.9-14½ga.J5	131
Atlanta A11	134
Bartonville,Ill.(19) K4	131
Crawfordsville,Ind. M8	133
Donora,Pa. A7	131
Duluth,Minn. A7	131
Fairfield,Ala. T2	131
Houston,Tex. S5	139
Johnstown,Pa. B2	131
Johnstown,17ga.,6" B2	205
Johnstown,17ga.,4" B2	208
Joliet,Ill. A7	131
KansasCity,Mo. S5	143
Kokomo,Ind. C16	133
Minnequa,Colo. C10	139
Monessen,Pa. P7	136
Pittsburg,Calif. C11	154
Portsmouth,O.(18) P12	138
Rankin,Pa. A7	131
So.Chicago,Ill. R2	127
Sterling,Ill.(1) N15	131

FENCE POSTS

ChicagoHts.,Ill. C2	140
Duluth,Minn. A7	125
Franklin,Pa. F5	140
Huntington,W.Va. W7	140
Johnstown,Pa. B2	140
Marion,O. P11	140
Minnequa,Colo. C10	130
Moline,Ill. R2	136
So.Chicago,Ill. R2	140
Tonawanda,N.Y. B12	140
Williamsport,Pa. S19	150

TRACK BOLTS (20) Treated

KansasCity,Mo. S5	9.85
Lebanon,Pa.(31) B2	9.85
Minnequa,Colo. C10	9.85
Pittsburgh O3, P14	9.85
Seattle B3	10.35

NAILS & STAPLES, Stock

To dealers & intrs. (7)	Col.
AlabamaCity,Ala. R2	118
Aliquippa,Pa.(13) J5	118
Atlanta A11	121
Bartonville,Ill.(19) K4	118
Chicago,Ill. W13	118
Cleveland A9	125
Crawfordsville,Ind. M8	122
Donora,Pa. A7	118
Duluth,Minn. A7	118
Fairfield,Ala. T2	118
Galveston,Tex. D7	126
Houston,Tex. S5	126
Johnstown,Pa. B2	118
Joliet,Ill. A7	118
KansasCity,Mo. S5	130
Kokomo,Ind. C16	120
Minnequa,Colo. C10	123
Monessen,Pa. P7	124
Pittsburg,Calif. C11	137
Portsmouth,O. P12	124
Rankin,Pa. A7	118
So.Chicago,Ill. R2	118
SparrowsPoint,Md. B2	120
Sterling,Ill.(1) N15	118
Torrance,Calif. C11	138
Worcester,Mass. A7	124

NAILS, Cut (100 lb keg)

To dealers (33)	
Conshohocken,Pa. A3	$7.35
Wheeling,W.Va. W10	7.35

TIE PLATES

Fairfield,Ala. T2	4.50
Gary,Ind. U5	4.50
Ind.Harbor,Ind. I-2	4.50
Lackawanna,N.Y. B2	4.50
Minnequa,Colo. C10	4.50
Pittsburg,Calif. C11	4.65
Seattle B3	4.65
Steelton,Pa. B2	4.50
Torrance,Calif. C11	4.65

JOINT BARS

Bessemer,Pa. U5	4.70
Fairfield,Ala. T2	4.70
Ind.Harbor,Ind. I-2	4.70
Joliet,Ill. U5	4.70
Lackawanna,N.Y. B2	4.70
Minnequa,Colo. C10	4.70
Steelton,Pa. B2	4.70

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1	6.15
KansasCity,Mo. S5	6.15
Lebanon,Pa. B2	6.15
Minnequa,Colo. C10	6.15
Pittsburgh J5	6.15
Seattle B3	6.65
So.Chicago,Ill. R2	6.15
Struthers,O. Y1	6.15
Youngstown R2	6.15

AXLES

Ind.Harbor,Ind. S13	5.60
Johnstown,Pa. B2	5.60

RAILS

	Std. No. 1	Std. No. 2	All No. 2	Std. Toe Rails 60 lb Under
Bessemer,Pa. U5	3.60	3.50	3.55	4.00
Ensley,Ala. T2	3.60	3.50	...	4.00
Fairfield,Ala. T2	...	...	...	4.00
Gary,Ind. U5	3.60	3.50	3.55	...
Huntington,W.Va. W7	...	...	...	5.00
Ind.Harbor,Ind. I-2	3.60	3.50	3.55	...
Johnstown,Pa. B2	...	...	...(16)	4.00
Lackawanna,N.Y. B2	3.60	3.50	...	4.00
Minnequa,Colo. C10	3.60	3.50	...	4.50
Steelton,Pa. B2	3.60	3.50	...	...
Williamsport,Pa. S19	...	...	...	4.75

TOOL STEEL

Grade	$ per lb
Regular Carbon	0.230
Extra Carbon	0.270
Special Carbon	0.325
Oil Hardening	0.350
5% Cr Hot Work	0.350
Hi-Carbon-Cr	0.635

Grade by Analysis

W	Cr	V	Co	Mo	
18	4	1	....		1.505
18	4	2	....		1.650
20.25	4.25	1.6	12.25	3.535	3.675
19	4	2	7		2.460
18.25	4.25	1	4.75		2.125
18	4	2	9		2.445-2.45
13.5	4	3	....		1.6025
W	Cr	V	Mo		
6.4	4.5	1.9	5		0.98-0.965
6	4	3	6		1.190
1.5	4	1	8.5		0.810

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

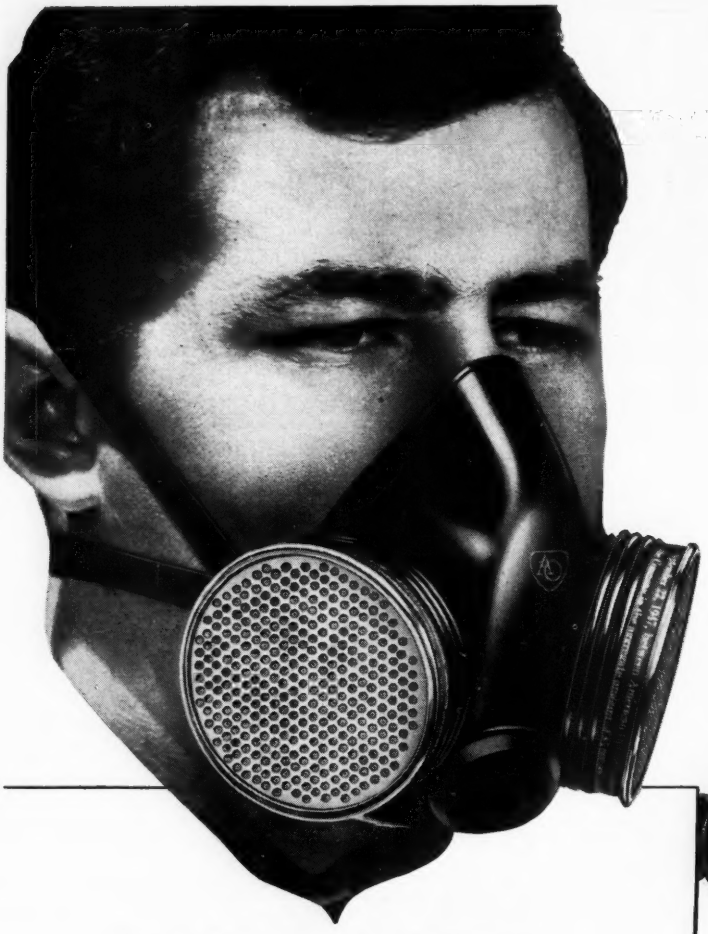
Footnotes:

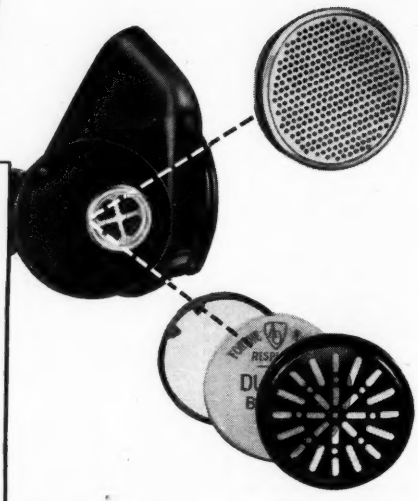
(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.50c for 17 Ga. & heavier.
(14) Also wide flange beams.
(15) ¼" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 28 Ga. 38" wide.
(24) Deduct 0.20c, finer than 15 Ga.
(25) Bar mill Lands.
(26) Reinforcing, mill. lengths, to fabricators; to consumers, 5.60c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Subject to 10% increase.
(30) Sheared: add 0.35c for universal mill.
(31) Not annealed.
(32) Rd. or square edge.
(33) To jobbers, deduct 20c.
(34) 7.25c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter: 60" & narrower.
(38) 14 gage & lighter: 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035": 0.035" and heavier, 0.25c higher.

Key to Producers

M1	McLouth Steel Corp.
M4	Mahoning Valley Steel
M5	Medart Co.
M6	Mercer Tube & Mfg. Co.
M8	Mid-States Steel & Wire
M9	Midvale Co.
M12	Moltrup Steel Products
M13	Monarch Steel Co.
M14	McInnes Steel Co.
N2	National Supply Co.
N3	National Tube Div.
N5	Nelsen Steel & Wire Co.
N6	NewEng-HighCarb.Wire
N8	Newman-Crosby Steel
N12	Niles Rolling Mill Div.
N14	Nrthwst. Steel Roll. Mills
N15	Northwestern S.&W. Co.
N16	New Delphos Mfg. Co.
O3	Oliver Iron & Steel Corp.
O4	Oregon Steel Mills
P1	Pacific States Steel Corp.
P2	Pacific Tube Co.
P4	Phoenix Iron & Steel Co.
P5	Pilgrim Drawn Steel
P6	Pittsburgh Coke & Chem.
P7	Pittsburgh Steel Co.
P9	Pittsburgh Tube Co.
P11	Pollak Steel Co.
P12	Portsmouth Division, Detroit Steel Corp.
P13	Precision Drawn Steel
P14	Pitts. Screw & Bolt Co.
P15	Pittsburgh Metallurgical
P16	Page Steel & Wire Div., Amer. Chain & Cable
P17	Plymouth Steel Co.
R1	Reeves Steel & Mfg. Co.
R2	Republic Steel Corp.
R3	Rhode Island Steel Corp.
R5	Roebling's Sons, John A.
R6	Rome Strip Steel Co.
R7	Rotary Electric Steel Co.
R8	RelianceDiv.,EatonMfg.
S1	Seneca Wire & Mfg. Co.
S3	Sharon Steel Corp.
S5	Sheffield Steel Corp.
S6	Shenango Furnace Co.
S7	Simmons Co.
S8	Simonds Saw & Steel Co.
S9	Sloss-Sheffield S.&I. Co.
S13	Standard Forgings Corp.
S14	Standard Tube Co.
S15	Stanley Works
S16	Struthers Iron & Steel
S17	Superior Drawn Steel Co.
S18	Superior Steel Corp.
S19	Sweet's Steel Co.
S20	Southern States Steel
T2	Tenn. Coal & Iron Div.
T3	Tenn. Prod. & Chem.
T4	Texas Steel Co.
T5	Thomas Steel Co.
T6	Thompson Wire Co.
T7	Timken Roller Bearing
T9	Tonawanda Iron Div. Am. Rad. & Stan. San.
U1	Ulster Iron Works
U4	Universal Cyclops Steel
U5	United States Steel Co.
V2	Vanadium-Alloys Steel
V3	Vulcan Crucible Steel Co.
W1	Wallace Barnes Co.
W2	Wallingford Steel Co.
W3	Washburn Wire Co.
W4	Washington Steel Corp.
W6	Weirton Steel Co.
W7	W. Va. Steel & Mfg. Co.
W8	West.Auto.Mach.Screw
W9	Wheatland Tube Co.
W10	Wheeling Steel Corp.
W12	Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13	Wilson Steel & Wire Co.
W14	Wisconsin Steel Div. International Harvester
W15	Woodward Iron Co.
W18	Wyckoff Steel Co.
Y1	YoungstownSheet&Tube

NEW AO RESPIRATOR LINE





Pay for ONE Facepiece, GET 7 TYPES OF PROTECTION with the AO R5000!

Yes, due to quick interchangeability of its threaded cartridges and disc type filter, the AO R5000 line of TWIN CARTRIDGE RESPIRATORS permits you to standardize on one respirator in protecting your workers against the multitude of dust, vapor and gas hazards commonly met with in industry. Remember, there's only one facepiece to stock and the R5000 offers greater visual area and many advanced construction features that mean added safety and comfort. Ask your nearest AO Safety Products Representative for the R5000. Tell him the respiratory hazards encountered in your operations and he will recommend the disc type filter and/or cartridges required.

QUICK, EASY INTERCHANGING!

Retainer assembly accommodates both chemical cartridges and AO disc type filter — the small chemically treated filter that gives 40 times the dust protection of untreated filters. The cartridges screw in — assures a positive gas-tight seal. The felt filters stay put safely by a cover that screws onto retainer assembly.

American Optical COMPANY
SAFETY PRODUCTS DIVISION

Dust Filter and Organic Vapor Cartridges, Combinations of both, and Metal Fume Cartridges Approved by the U. S. Bureau of Mines

Southbridge, Massachusetts • Branches in Principal Cities

STANDARD PIPE, T & C

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Black A	Black B	Black C	Galvanized D	Galvanized E	Galvanized F
⅛	5.5c	0.24	34.0	32.0	...	+0.5	+2.5	...
¼	6.0	0.42	28.5	26.5	...	+3.5	+5.5	...
⅜	6.0	0.57	23.5	21.5	...	+10.0	+12.0	...
½	8.5	0.85	36.0	34.0	35.0	12.0	10.0	11.0
¾	11.5	1.18	39.0	37.0	38.0	16.0	14.0	15.0
1	17.0	1.68	41.5	39.5	40.5	19.5	17.5	18.5
1¼	23.0	2.28	42.0	40.0	41.0	20.5	18.5	19.5
1½	27.5	2.78	42.5	40.5	41.5	21.5	19.5	20.5
2	37	3.68	43.0	41.0	42.0	22.0	20.0	21.0
2½	58.5	5.82	43.5	41.5	42.5	23.0	21.0	22.0
3	76.5	7.62	43.5	41.5	42.5	23.0	21.0	22.0

Column A: Etna, Pa. N2 and 36½% on 3½", 4"; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va., 3½ points lower on ⅛"; 1½ points lower on ¼", and 2 points lower on ⅜", W10; Sharon, Pa. M6, 1 point higher on ½"; 2 points lower on ¼" and ⅜"; Wheatland, Pa. W9, 2 points lower on ⅜", ¼", ⅜". Following make ½" and larger: Lorain, O., N3; Youngstown R2 and 36¼% on 3½" and 4"; Youngstown Y1; Aliquippa, Pa. J5; Fontana, Calif. K1 quotes 11½ points lower on ½" and larger continuous weld and 24% on 3½" and 4".

Columns B & E: Sparrows Point, Md. B2.

Columns C & F: Indiana Harbor, Ind., Y1; Alton, Ill., (Gary base) 2 points lower discount L1.

Column D: Butler, Pa. F6, ⅛-⅜"; Benwood, W. Va. W10, except plus 4% on ⅛", plus 6% on ¼", plus 13% on ⅜" and 15.5% on 3½", 4"; Sharon, Pa. M6, plus 2.5 on ⅛", 1 point lower on ½", ¾", 1½ points lower on 1" and 1¼", 2 points lower on 1½", 2", 2½" and 3"; Wheatland, Pa. W9, add 2 points on ⅛", ¼", ⅜", 1 point lower on ¾", 2 points lower on 1", 1½", 2", 1½ points lower on 1¼", 2½", 3". Etna, Pa. N2 and 15.5% on 3½", 4". Following quote only on ½" and larger: Lorain, O. N3; Youngstown R2, and 15½% on 3½" and 4"; Youngstown Y1, Aliquippa, Pa. J5 quotes 1 point lower on ¾", 2 points lower on 1", 1½", 2", 1½ points lower on 1¼", 2½" and 3".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	3.68	29.5	8.0	29.5	8.0
2½	58.5	5.82	32.5	11.5	32.5	11.5
3	76.5	7.62	32.5	11.5	32.5	11.5
3½	92.0	9.20	34.5	13.5	34.5	13.5
4	$1.09	10.89	34.5	13.5	34.5	13.5
5	1.48	14.81	37.0	16.0	37.0	16.0
6	1.92	19.18	37.0	16.0	37.0	16.0

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5 quotes 1¼ pts lower on 2", 1 pt lower on 2½-6-in.; Lorain N3; Youngstown Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft., mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	13.45	16.47	15.36	15.36
1¼	13	16.09	19.71	15.61	18.19
1½	13	17.27	21.15	17.25	20.30
1¾	13	19.29	23.62	19.62	23.09
2	13	21.62	26.48	21.99	25.86
2¼	13	24.35	29.82	24.50	28.84
2¼	12	26.92	32.97	26.98	31.76
2½	12	29.65	36.32	29.57	34.76
2¾	12	32.11	39.33	31.33	36.84
3	12	34.00	41.64	32.89	38.70

CLAD STEELS

(Cents per pound)

Cladding Stainless	Plates 10%	Plates 20%	Strip Cold-Rolled Carbon Base 10%	Strip Cold-Rolled Carbon Base Both Sides	Sheets Carbon Base 10%	Sheets Carbon Base 20%	Sheets Cu Base Both Sides
302 ...	....	....	....	....	19.75	26.24–27.50	77.00
304 ...	25.00	29.50	....	....	24.50	27.50–27.77	77.00
309 ...	30.50	35.00	....	....	....	....	....
310 ...	36.50	41.00	....	....	....	....	144.00
316 ...	29.50	34.00	....	....	26.00	35.92–36.50	....
317 ...	34.50	39.00	....	....	....	....	....
318 ...	33.50	38.00	....	....	....	....	....
321 ...	26.50	31.00–32.00	....	....	23.00	33.00	111.00
347 ...	27.50	32.00	....	....	24.00	33.50–33.83	130.00
405 ...	21.25	27.75	....	....	....	....	....
410 ...	20.75	27.25	....	....	....	....	....
Nickel.	33.55	45.15	41.00	54.00	....	....	....
Inconel.	41.23	54.18	....	....	....	....	165.00
Monel..	34.93	46.28	....	....	....	....	....
Copper*	....	....	23.70†	29.65‡	....	....	....

* Deoxidized. † 20.20c for hot-rolled. ‡ 26.40c for hot-rolled. Production points for carbon base products: Stainless plates, sheet, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C 22, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; nickel, copper-clad strip, Carnegie, Pa., S18. Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:

½-in. & smaller diam.	15
⅝-in. & ⅞-in.	18.5
1-in. and larger	17.5

Longer than 6 in.:

All diams.	14

Lag bolts, all diams.:

6 in. and shorter	23
over 6 in. long	21
Ribbed Necked Carriage	18.5
Blank	34
Plow	34
Step, Elevator, Tap and Sleigh Shoe	21
Tire bolts	12
Boiler & Fitting-Up Bolts	31

NUTS

	Reg.	Hvy.
H.P. & C.P. Square:		
½-in. & smaller	15	15
⅝-in. & ⅞-in.	12	6.5
1-in.-1⅛-in.	9	1
1⅛-in. & larger	7.5	1
H.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ⅞-in.	16.5	6.5
1-in.-1½-in.	12	2
1⅝-in. & larger	8.5	2
C.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ⅞-in.	23	17.5
1-in. & 1½-in.	19.5	12
1⅝-in. & larger	12	6.5

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)

	Reg.	Hvy.
½-in. & smaller	35	28.5
⅝-in. & ⅞-in.	29.5	22
1-in.-1½-in.	24	15
1⅝-in. & larger	13	8.5
		Light
⅞-in & smaller		35
1-in. to ⅝-in.		28.5
¾-in. to 1½-in.		26

STEEL STOVE BOLTS

(F.o.b. plant; per cent off list in packages)

Plain finish	48 & 10
Plated finishes	31 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged: per cent off list)

6 in. or shorter:

⅝-in. & smaller	42
¾-in. through 1 in.	34

Longer than 6 in.:

⅝-in. & smaller	26
¾-in. through 1 in.	4

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter	38
1 in. and smaller diam. x over 6 in.	26

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	35
¼-in. diam. & larger	16
N.F. thread, all diams.	10

RIVETS

F.o.b. midwestern plants

Structural ½-in., larger 7.85c

⅞-in. under ..... 36 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers—List to list-plus $1

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 70%, $43; 60%, $40.

Imported, net ton, duty paid, metallurgical grade, $33-$35.

ELECTRODES

(Threaded, with nipples, unboxed f.o.b. plant)

GRAPHITE

Inches Diam.	Length	Cents per lb
17,18,20	60,72	17.85
8 to 16	48,60,72	17.85
7	48,60	19.57
6	48,60	20.95

CARBON

35,40	110	8.03
30	65,84,110	8.03
24	72 to 104	8.03
17 to 20	34,90	8.03

STAINLESS STEEL

Type	Sheets	C.R. Strip	Bars Wire Structurals
301...	41.00	34.00	31.25
302...	41.25	36.75	31.50
303...	43.25	40.25	34.00
304...	43.25	38.75	33.00
309...	56.00	55.00	44.75
316...	57.00	59.00	49.25
321...	49.25	48.25	37.00
347...	53.75	52.25	41.50
410...	36.50	30.50	25.75
416...	37.00	37.00	26.25
420...	44.00	47.00	31.25
430...	39.00	31.00	26.25
501...	27.50	26.00	14.25
502...	28.50	27.00	15.25

Balt., Types 301-347 sheet, except 303 and 309 E2.

Brackenridge, Pa., Sheets A4 quotes slight variations on Types 301-347.

Bridgeville, Pa., bars, wire, sheets & strip U4.

Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502, A10.

Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502 S18.

Cleveland, strip A7.

Detroit, strip M1 quotes 34.00c on Type 301; 36.50c, 302; 38.50c, 304; 58.50c, 316; 52.00c, 347; 30.50c, 410; 31.00c, 430.

Dunkirk, N. Y., bars, wire A4 quotes slight variations on Types 301-347.

Duquesne, Pa., bars U5.

Fort Wayne, Ind., bars and wire, except Types 501 & 502 J6 quotes slight variations on Types 301-347.

Gary, Ind., sheets except Type 416 U5.

Harrison, N. J., strip and wire C18.

Massillon, O., all items, R2.

McKeesport, Pa., strip, Type 410; bars & wire, Types 410 through 430 and 31.25c on Type 302, 33.75c on 303, 32.75c on 304, 48.75c on 316, 36.75c on 321, 41.25c on 347 F2.

McKeesport, Pa., bars, sheets except Type 416 U5.

Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & strip C18.

Munhall, Pa., bars U5.

Muncie, Ind., wire I-7 quotes types 302, 304, 430.

Pittsburgh, sheets C18.

Reading, Pa., strip except 34.25c on Type 301 and 56.00c on 309; bars, except 31.50c on Type 301 and 45.25c on 309 C4.

Sharon, Pa., strip, except Types 303, 309, 416, 501, 502 and 34.25c on Type 301 S3.

So. Chicago, Ill., bars & structurals U5.

Syracuse, N. Y., bars, wire & structurals C18.

Titusville, Pa., bars U4.

Wallingford, Conn., strip W2 quotes 0.25c higher.

Washington, Pa., bars, sheets & strip, except 0.25c higher on Type 301 J3.

Washington, Pa., Types 301 through 347 sheets & strip except 303, 309; 316 sheets 62.00c, strip 64.00c W4.

Watervliet, N. Y., structurals & bars A4 quotes variations on Types 301-347.

Waukegan, bars & wire A7.

West Leechburg, Pa., strip, A4 quotes slight variations on Types 301-347.

Youngstown, strip except Types 303, 309, 316, 416 501 and 502 and 34.25c on Type 301 C8.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol 30.00-35.00

Toluol, one deg...26.00-33.00

Industrial xylol...25.00-33.50

Per ton bulk ovens

Sulphate of ammonia..$32-$45

Cents per pound, ovens

Phenol, 40 (carlots, non-returnable drums) ..17.25

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted.)

Sponge iron 98+% Fe, carlots..	Cents 17.00
Swedish, c.l.f New York, in bags..	8.85-9.95
Electrolytic iron: Annealed, 99.5% Fe.	42.50
Unannealed (99 + % Fe)	36.50
Unannealed, 99 + % Fe (minus 325 mesh)	53.50
Powder Flakes	48.50
Carbonyl Iron: 97.9-99.8% size 5 to 10 microns..	83.00-148.00
Aluminum: Carlots, freight allowed	29.50
Atomized, 500 lb drums, freight allowed	32.50
Antimony	75.85
Brass, 20-ton lots	30.00-33.25
Bronze, 10-ton lots	51.25-60.00
Phosphor - Copper, 20-ton lots	50.00
Copper: Electrolytic	37.25
Reduced	33.75
Lead	26.30
Magnesium	75.00-85.00
Manganese: Minus 100-mesh	57.00
Minus 35 mesh	52.00
Minus 200 mesh	62.00
Nickel unannealed	86.00
Nickel-Silver 5-ton lots	45.00
Silicon	38.50
Solder (plus cost of metal)	8.50
Stainless Steel, 302	83.00
Zinc, 10-ton lots	25.00-32.50
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh: 1000 lb and over	6.00
Less than 1000 lb	6.15
98.8% minus 65 mesh: 1000 lb and over	4.15
Less than 1000 lb	4.25
Molybdenum: 99.9%, minus 200 mesh	3.24
Chromium, electrolytic 99% Cr min.	3.50

METALLURGICAL COKE

Price net ton

BEEHIVE OVENS

Connellsvil.fur.	$14.50-15.00
Connellsvil.fdy.	17.00-18.00
New River foundry	21.30
Wise county, foundry	15.95
Wise county, furnace	15.20

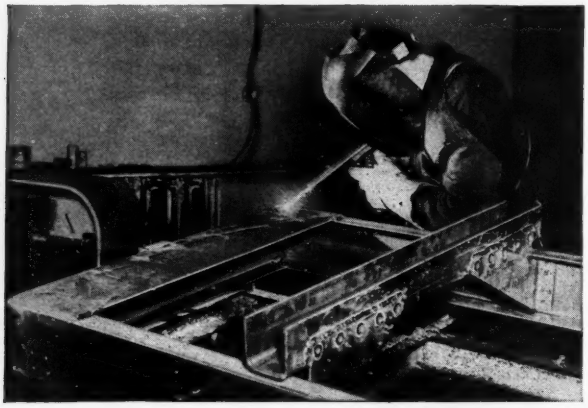
OVEN FOUNDRY COKE

Kearney, N. J. ovens	$22.75
Everett, Mass., ovens	
New England, del...	*24.80
Chicago ovens	23.00
Chicago, del.	24.50
Terre Haute, ovens	22.50
Milwaukee, ovens	23.75
Indianapolis, ovens	22.75
Chicago, del.	26.42
Cincinnati, del.	25.85
Detroit, del.	26.85
Ironton, O., ovens	22.50
Cincinnati, del.	25.12
Painesville, O., ovens	24.00
Cleveland, del.	25.82
Erie, Pa., ovens	23.50
Birmingham, ovens	20.30
Birmingham, del.	21.60
Philadelphia, ovens	22.70
NevilleIsland,Pa.,ovens	23.00
Swedeland, Pa., ovens.	22.60
St. Louis, ovens	
St. Louis, del.	25.40
Portsmouth, O., ovens	22.50
Cincinnati, del.	25.12
Detroit, ovens	24.00
Detroit, del.	25.00
Buffalo, del.	26.89
Flint, del.	26.59
Pontiac, del.	25.47
Saginaw, del.	26.92

* Or within $4.55 freight zone from works.

Aircomatic welding frame of Marotta Trailer. Each trailer required about 260 lineal inches of weld. Welding wire fed into the joints at 225 inches per minute permitted a new trailer to come off the line every half hour . . . eight times faster than possible with older methods.

Trailers manufactured by the Marotta Engineering Co., Boonton, N. J., for use on U. S. Air Force bases. They are used singly or in trains to move supplies rapidly for plane loadings.



THERE'S A LONG, LONG TRAILER WINDING...

Welding AIRCOMATIC® . . . a result of High-Speed

Trailer trains to move supplies and plane loads rapidly are part of the efficiency found on U. S. Air Forces bases the world over.

Building the required trailers was the job of the Marotta Engineering Co. of Boonton, N. J. For lightweight strength, aluminum was used . . . for rugged dependability and lasting service, arc welded design was chosen.

To match the high quality of the 61S-T6 aluminum . . . and to meet the high production schedules . . . trailers were fabricated with Air Reduction's inert-gas-shielded metal-arc welding process — Aircomatic.

Aluminum — and other hard-to-weld metals, stainless, bronze, monel, and other nickel alloys — are easy-welding when Aircomatic is on the job.

This economical, fast-welding technique makes possible fewer passes on heavier metal . . . faster, heavy deposits for overlay work or build-up. Electrode changes and slag removal are eliminated, permitting almost 100% arc time at high operating speeds.

Facts and figures you need to know about Aircomatic equipment are available in your copy of Catalog 17: "Aircomatic Process" . . . call your nearest Airco office, or write Air Reduction Sales Company, Advertising Department, 60 East 42nd Street, New York 17, N. Y.

AN AIR REDUCTION PRODUCT

AT THE FRONTIERS OF PROGRESS YOU'LL FIND

AIRCO®

DEALERS AND OFFICES IN PRINCIPAL CITIES

AIR REDUCTION

AIR REDUCTION SALES COMPANY • AIR REDUCTION MAGNOLIA COMPANY • AIR REDUCTION PACIFIC COMPANY

REPRESENTED INTERNATIONALLY BY AIRCO COMPANY INTERNATIONAL

DIVISIONS OF AIR REDUCTION COMPANY, INCORPORATED

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, for delivery within switching limits, subject to extras.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140[5]		Carbon	Floor
New York (city)	6.28	7.24	8.54	6.50	...	6.52	7.33	9.29	6.38	6.76	8.01
JerseyCity(c'try)	6.09	6.94	8.27	6.36	...	6.22	7.03	8.99	6.08	6.46	7.71
Boston (city) ..	6.40	7.20	8.63	6.32	...	6.25	7.24	10.80	6.40	6.60	7.84
Boston (c'try) .	6.20	7.00	8.43	6.12	...	6.05	7.04	10.60	6.20	6.40	7.64
Phila. (city) ..	6.04	6.97	8.35	6.29	7.11	6.29	7.16	10.48	6.10	6.38	7.29
Phila. (c'try) .	5.79	6.72	8.10	6.04	6.86	6.04	6.91	10.23	5.85	6.13	7.04
Balt. (city) ..	5.74	7.00	8.40	6.23	...	6.21	6.83	...	6.33	6.33	7.57
Balt. (c'try) ..	5.54	6.80	8.20	6.03	...	6.01	6.63	...	6.13	6.13	7.37
Norfolk, Va. ..	6.78	...	...	...	...	6.04	7.30	...	6.30	6.30	7.15
Richmond, Va..	5.74	6.57	8.38	6.14	...	5.91	6.59	...	6.72	6.86	8.00
Wash. (w'hse)..	6.05	7.26	8.49	6.50	...	6.50	7.26	...	6.60	6.65	7.86
Buffalo (del.)..	5.74	6.52	8.46	6.06	...	5.72	6.65	10.72††	6.02	6.18	7.55
Buffalo (w'hse).	5.54	6.32	8.26	5.86	...	5.52	6.45	10.52††	5.82	5.98	7.35
Pitts. (w'hse) .	5.54	6.32	8.25	5.84	6.90	5.47	6.40	10.10††	5.45	5.70	6.69
Detroit (w'hse).	5.74	6.49	8.55	5.78	7.15	5.76	6.60	10.37††	6.12	6.17	7.23
Cleveland (del.)	5.74	6.52	8.18	5.85	7.14	5.81	6.60	8.91	6.18	6.02	7.43
Cleve. (w'hse) .	5.54	6.32	7.98	5.65	6.94	5.61	6.40	8.71	5.98	5.82	7.23
Cincin. (w'hse).	5.82	6.34	8.27	5.74	...	5.72	6.61	10.47††	6.07	6.12	7.26
Chicago (city) .	5.74	6.52	8.05	5.69	...	5.67	6.50	10.30††	5.85	5.90	7.09
Chicago (w'hse)	5.54	6.32	7.85	5.49	...	5.47	6.30	10.10††	5.65	5.70	6.89
Milwau. (city) .	5.91	...	8.22	5.86	...	5.84	6.77	10.37††	6.02	6.07	7.26
Milwau. (c'try)	5.71	...	8.02	5.66	...	5.64	6.57	10.17††	5.82	5.87	7.06
St. Louis (del.)	6.04	6.82	8.35	5.99	...	5.97	6.90	10.60††	6.25	6.30	7.49
St. L. (w'hse) .	5.84	6.62	8.15	5.79	...	5.77	6.70	10.40††	6.05	6.10	7.29
Kans. City(city)	6.40	7.20	8.40	6.35	...	6.35	7.20	...	6.50	6.60	7.80
Kans.City(w'hse)	6.20	7.00	8.20	6.15	...	6.15	7.00	...	6.30	6.40	7.60
Birm'hm (city).	5.75	6.55	6.90[2]	5.70	...	5.70	7.53	...	5.85	6.10	8.23
Birm'hm(w'hse)	5.60	6.40	6.75[2]	5.55	...	5.55	7.52	...	5.70	5.95	8.23
Los Ang. (city)	6.50	8.30[3]	9.50	6.60	10.65	6.45	8.35	11.50††	6.50	6.50	8.75
L. A. (w'hse)..	6.30	8.10[3]	9.30	6.40	10.45	6.25	8.15	11.30††	6.30	6.30	8.55
Seattle-Tacoma.	7.01	8.64	9.55	7.40	...	6.70	8.80	10.35	6.70	6.78	8.73
San Fran. (city)	6.54	7.83[3]	9.20[3]	6.40	...	6.40	8.15	11.25	6.20	6.33	8.45

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; § as rolled; ** 16 gauge; †† as annealed; §§ 15 gage. Base quantities, 2000 to 9999 lb except as noted. Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; [3]—500 to 1499 lb; [2]—450 to 1499 lb; [4]—3500 lb and over; [5]—1000 to 1999 lb.

Ores

Lake Superior Iron Ore
(1951 contract prices; 1952 prices not established)

Gross ton, 51½% (natural), lower lake ports. After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in applicable lake vessel rates, upper lake rail, freights, dock handling charges and taxes thereon.

Old range bessemer	$8.70
Old range nonbessemer	8.55
Mesabi bessemer	8.45
Mesabi nonbessemer	8.30
High phosphorus	8.30

Eastern Local Ore
Cents per unit del., E. Pa.

Foundry and basic 56-62% concentrates contract	17.00

Foreign Ore
Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	nom.
Long-term contract	$20.00-24.00
North African hematites (spot)	26.00-28.00
Brazilian iron ore, 68-69% (spot)—	30.00-31.00

Tungsten Ore
Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$65.00
Domestic scheelite mines	65.00

Manganese Ore

Manganese, 48% nearby, $1.18-1.22 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 85c-87c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African	
48% 2.8:1	$39.00-42.00
48% 3:1	44.00-45.00
48% no ratio	30.00-32.00
South African Transvaal	
44% no ratio	$27.00-28.00
48% no ratio	34.00-35.00
Brazilian	
44% 25:1 lump	nom.
Rhodesian	
45% no ratio	$29.00
48% no ratio	31.50-32.00
48% 3:1 lump	50.00-51.00
Domestic—rail nearest seller	
48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb, molybdenum content, mines	$1.00

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $75, Palmerton, Pa; $75, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $185 per gross ton of alloy, c.l. packed, $197; gross ton lots, packed, $212; less gross ton lots, packed $229; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., or Ashtabula, O. Base price: $187, Johnstown, Pa.; $185, Sheridan, Pa.; $188, Etna, Pa.; $186, Anaconda, Mont.

Shipment from Pacific Coast warehouses by one seller, add $33 to above prices f.o.b. Los Angeles, Oakland, Portland, Oreg. Shipment from Chicago warehouse, ton lots $227; less gross ton lots, $244, f.o.b. Chicago. Add or subtract $2.30 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 25.75c per lb of contained Mn, carload packed 26.5c ton lots 27.6c, less ton 28.8c. Delivered. Deduct 0.5c for max, 0.15% C grade from above prices, 1c for max, 0.30% C, 1.5c for max 0.50% C, and 4.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 0.5c to above prices. Spot, add 0.25c

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max). Carload, lump, bulk 19.15c per lb of contained Mn, carload packed 19.9c, ton lot 21.0c, less ton 22.2c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 96% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 34c per lb or metal; packed, 34.75c; ton lot 36.25c; less ton lots 38.25c. Delivered. Spot, add 2c.

Manganese, Electrolytic: 40,000 lb or more, 28c; 20^00 to 39,999 lb, 30c; 250 to 1999 lb, 32c. Premium for hydrogen-removed metal, 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65 - 68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si 9.90c per lb of alloy, carload packed, 10.65c, ton lots 11.55c, less ton 12.55c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18% C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%.) Contract, $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max., C 0.4% max). Contract, ton lot, 2" x D, $4.90 per lb of contained Cb, less ton $4.95. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx, Ta 20% approx, and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $3.75 per lb of contained Cb plus Ta, deld.; less ton lots $3.80.

Silicax Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed, 1" x D, 45c per lb of alloy, ton lot 47c, less ton ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, carload, packed, ¼" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 18c per lb of alloy; ton lots 19c; less ton lots 20.50c, f.o.b. Niagara Falls N. Y.; freight allowed to St. Louis.

V-S Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 15c per lb of alloy; ton lots 16.50c; less ton lots 17.75c, f.o.b., Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal. Fe) Lump, carload bulk 14.50c, packed 15.50c; ton lots, packed, 15.75c; less ton lots, packed, 16.25c per lb of alloy, delivered to destination within United States.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo f.o.b. Langeloth, $1.32 in all sizes except powdered which is $1.41; Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic-Oxide: Per lb, contained Mo., f.o.b. Langeloth, Pa., $1.14, in cans; in bags, $1.13, f.o.b. Langeloth, Pa.; Washington, Pa., $1.13.

NOTE: Current prices on chromium, silicon, vanadium, boron and tungsten alloys appeared on page 173, May 19 issue; calcium zirconium and briquetted alloys, page 179, May 12. Refractories prices also were published on page 179, May 12 issue.

CEILING PRICES, IRON AND STEEL SCRAP

Prices as set forth in Office of Price Stabilization ceiling price regulation No. 5, as amended Feb. 5, 1952.

STEELMAKING SCRAP COMPOSITE

May 22	$43.00
May 15	43.00
Apr. 1952	43.00
May, 1951	44.00
May, 1947	29.75

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin; and from which ceiling on-line and ceiling delivered prices are computed on scrap of railroad origin..

Basing Point	No. 1 Bundles Dealer, Industrial	No. 1 Heavy Melt Railroad
Alabama City, Ala.	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00
Harrisburg, Pa.	42.50	44.50
Houston, Tex.	37.00	39.00
Johnstown, Pa.	44.00	46.00
Kansas City, Mo.	39.50	41.50
Kokomo, Ind.	42.00	44.00
Los Angeles	35.00	37.00
Middletown, O.	43.00	45.00
Midland, Pa.	44.00	46.00
Minnequa, Colo.	38.00	40.00
Monessen, Pa.	44.00	46.00
Phoenixville, Pa.	42.50	44.50
Pittsburg, Calif.	35.00	37.00
Pittsburgh, Pa.	44.00	46.00
Portland, Oreg.	35.00	37.00
Portsmouth, O.	42.00	44.00
St. Louis, Mo.	41.00	43.00
San Francisco	35.00	37.00
Seattle, Wash.	35.00	37.00
Sharon, Pa.	44.00	46.00
Sparrows Pt., Md.	42.00	44.00
Steubenville, O.	44.00	46.00
Warren, O.	44.00	46.00
Weirton, W. Va.	44.00	46.00
Youngstown, O.	44.00	46.00

Differentials from Base

Differentials per gross ton for other grades of dealer and industrial scrap:

O-H and Blast Furnace Grades

2. No. 1 Busheling	Base
3. No. 1 Heavy Melting	—$1.00
4. No. 2 Heavy Melting	— 1.00
5. No. 2 Bundles	— 1.00
6. Machine Shop Turnings	— 10.00
7. Mixed Borings and Short Turnings	— 6.00
8. Shoveling Turnings	— 6.00
9. No. 2 Busheling	— 4.00
10. Cast Iron Borings	— 6.00

Elec. Furnace and Fdry. Grades

11. Billet, Bloom & Forge Crops	+ 7.50
12. Bar Crops & Plate	+ 5.00
13. Cast Steel	+ 5.00
14. Punchings & Plate Scrap	+ 2.50
15. Electric Furnace Bundles	+ 2.00

Cut Structurals & Plate:

16. 3 feet and under	+ 3.00
17. 2 feet and under	+ 5.00
18. 1 foot and under	+ 6.00
19. Briquetted Cast Iron Borings	Base

Foundry, Steel:

20. 2 feet and under	Base
21. 1 foot and under	+ 2.00
22. Springs and Crankshafts	+ 1.00
23. Alloy Free Turnings	— 3.00
24. Heavy Turnings	— 1.00
25. Briquetted Turnings	Base
26. No. 1 Chemical Borings	— 3.00
27. No. 2 Chemical Borings	— 4.00
28. Wrought Iron	+10.00
29. Shafting	+10.00
31. Old Tin & Terne Plated Bundles	—10.00

Unprepared Grades

When compressed constitutes:

32. No. 1 Bundles	— 6.00
33. No. 2 Bundles	— 9.00
34. Other than material suitable for hydraulic compression	— 8.00

Restrictions on Use

(1) Prices for Grades 11 and 23 may be charged only when shipped to a consumer directly from an industrial producer; otherwise ceiling prices shall not exceed prices established for Grades 12 and 8, respectively.

(2) Prices established for Grades 26 and 27 may be charged only when sold for use for chemical or annealing purposes, and in the case of Grade 27, for briquetting and direct charge into an electric furnace; otherwise ceiling prices shall not exceed price established for Grade 10.

(3) Prices established for Grade 28 may be charged only when sold to a producer of wrought iron; otherwise ceiling price shall not exceed ceiling price for corresponding grade of basic open-hearth.

(4) Premiums for Grades 11-18, 20 and 21 may be charged only when sold for use in electric and acid open-hearth furnaces or foundries; or in basic O-H or blast furnace under NPA allocation or OPS authorization.

(5) Prices for Grade 29 may be charged only when sold for forging or rerolling purpose.

Special Pricing Provisions

(1) Sellers of Grades 26 and 27 may make an extra charge of $1.50 per ton for loading in box cars, or 75 cents per ton for covering gondola cars with a weather-resistant covering.

(2) Ceiling price of pit scrap, ladle scrap, salamander scrap, skulls skimmings or scrap recovered from slag dumps and prepared to charging box size, shall be computed by deducting from the price of No. 1 heavy melting steel of dealer and industrial origin, the following amounts: Where iron content is 85% and over, $6; 75% and over, $10; less than 75%, $12.

(3) Ceiling price of any inferior grade of scrap not listed shall not exceed the price of No. 1 bundles less $15.00.

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 railroad heavy melting steel) for other grades of railroad steel scrap:

2. No. 2 Heavy Melting Steel	—$2.00
3. No. 2 Steel Wheel	Base
4. Hollow Bored Axles and loco. axles with keyways between the wheelseats.	Base
5. No. 1 Busheling	— 3.50
6. No. 1 Turnings	— 3.00
7. No. 2 Turnings, Drillings & Borings	—12.00
8. No. 2 Cast Steel and uncut wheelcenters	— 6.00
9. Uncut Frogs, Switches.	Base
10. Flues, Tubes & Pipes	— 8.00
11. Structural, Wrought Iron and/or/steel, uncut	— 6.00
12. Destroyed Steel Cars	— 8.00
13. No. 1 Sheet Scrap	— 9.50
14. Scrap Rails, Random Lengths	+ 2.00
15. Rerolling Rails	+ 7.00

Cut Rails:

16. 3 feet and under	+ 5.00
17. 2 feet and under	+ 6.00
18. 18 inches and under	+ 8.00
19. Cast Steel, No. 1	+ 3.00
20. Uncut Tires	+ 2.00
21. Cut Tires	+ 5.00

Bolsters & Side Frames:

22. Uncut	Base
23. Cut	+ 3.00
24. Angles, Splice Bars & Tie Plates	+ 5.00
25. Solid Steel Axles	+12.00
26. Steel Wheels, No. 3 oversize	Base
27. Steel Wheels, No. 3	+ 5.00
28. Spring Steel	+ 5.00
29. Couplers & Knuckles	+ 5.00
30. Wrought Iron	+ 8.00
31. Fireboxes	— 8.00
32. Boilers	— 6.00
33. No. 2 Sheet Scrap	—13.00
34. Carsides, Doors, Car Ends, cut apart	— 6.00
35. Unassorted Iron & Steel	— 6.00
36. Unprepared scrap, not suitable for hydraulic compression	— 8.00

Restrictions on Use

(1) Price established for Grade 15 may be charged only when purchased and sold for rerolling uses; otherwise, ceiling shall not exceed that for Grade 14.

(2) Price established for Grade 30 may be charged only when sold to a producer of wrought iron; otherwise, ceiling shall not exceed that for No. 1 heavy melting steel.

(3) Price for Grade 25 may be charged only when sold for rerolling and forging purposes; otherwise, ceiling shall not exceed that for base grade (No. 1).

Preparation Charges

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of dealer or industrial origin authorized by OPS are:

(1) For preparing into Grades No. 3, No. 4 or No. 2, $5.
(2) For hydraulically compressing Grade No. 1, $6 per ton; Grade No. 5, $8.
(3) For crushing Grade No. 6, $3. For preparing into:
(4) Grade No. 25, $6.
(5) Grade No. 19, $6.
(6) Grades No. 12, No. 13, No. 14, No. 16, or No. 20, $10.
(7) Grade No. 17 or No. 21, $11.
(8) Grade No. 18, $12.
(9) For hydraulically compressing Grade No. 15, $8.
(10) For preparing into Grade No. 28, $10.

Ceiling fees per gross tons which may be charged for intransit preparation of any grade of steel scrap of railroad origin shall be:

(1) For preparing into Grade No. 1 and Grade No. 2, $8.
(2) For hydraulically compressing Grade No. 13, $6.

For preparing into:

(3) Grade No. 16, $4.
(4) Grade No. 17, $5.
(5) Grade No. 18, $7.
(6) Grade No. 21, $4.
(7) Grade No. 23, $4.

Ceiling fees per gross ton which may be charged for intransit preparation of cast iron are limited to:

(1) For preparing Grade No. 8 into grade No. 7, $9.
(2) For preparing Grade No. 3 into Grade No. 11, $7.
(3) For preparing Grade No. 3 into Grade No. 1, $4.

Premium for Alloy Content

No premium may be charged for alloy content except: $1.25 per ton for each 0.25% of nickel where scrap contains not less than 1% and not over 5.25% nickel; $2 per ton for scrap containing not less than 0.15 per cent molybdenum and $3 for scrap containing not less than 0.65% molybdenum; for scrap containing not less than 10% manganese, $4 for scrap in sizes larger than 12 x 24 x 8 in., and $14 for scrap cut in that size or smaller (applicable only if scrap is sold for electric furnace uses or on NPA allocation); $1 for scrap conforming to SAE 52100.

CAST IRON SCRAP

Ceiling price per gross ton for following grades shall be f.o.b. shipping point:

Cast Iron:

1. No. 1 (Cupola)	$49.00
2. No. 2 (Charging Box)	47.00
3. No. 3 (Hvy. Breakable)	45.00
4. No. 4 (Burnt Cast)	41.00
5. Cast Iron Brake Shoes	41.00
6. Stove Plate	46.00
7. Clean Auto Cast	52.00
8. Unstripped Motor Blocks	43.00
9. Wheels, No. 1	47.00
10. Malleable	55.00
11. Drop Broken Machinery	52.00

Restrictions on Use

(1) Ceiling shipping point price which a basic open-hearth consumer may pay for No. 1 cast iron, clean auto cast, malleable or drop broken machinery cast shall be ceiling price for No. 2 charging box cast.

OPEN MARKET PRICES

CAST SCRAP

Birmingham
(Delivered)

No. 1 cupola cast	$42.00-43.00
Stove plate	38.00-39.00
Charging box cast	39.00-40.00
Heavy breakable	36.00-37.00
Drop broken machinery	42.00-43.00
Unstripped motor blocks	35.00-36.00

Boston
(F.o.b. shipping point)

No. 1 cupola cast	40.00*
No. 1 machinery cast	45.00
Unstripped motor blocks	30.00

* Delivered.

Buffalo
(Delivered)

No. 1 cupola cast	43.00-44.00

Chicago
(Delivered)

No. 1 cupola cast	45.00-49.00
Charging box cast	42.00
Heavy breakable	40.00
Burnt cast	40.00
Cast iron brake shoes	41.00
Stove plate	42.00
Unstripped motor blocks	35.00
Malleable	55.00
Drop broken machinery	52.00

Cleveland
(Delivered)

No. 1 cupola cast	44.00

Detroit
(Brokers' buying prices; f.o.b. shipping point)

No. 1 cupola cast	47.00
Heavy breakable	40.00
Clean auto cast	47.00-49.00
Unstripped motor blocks	38.00
Drop broken machinery	48.00-49.00
Stove plate	43.00-44.00
Charging box cast	45.00-47.00

New York
(Brokers' buying prices; delivered consumers' plants)

Cupola cast	40.00
Unstripped motor blocks	34.00

Philadelphia
(Delivered)

No. 1 cupola cast	40.00-41.00
Unstripped motor blocks	35.00
Heavy breakable	42.00

Pittsburgh
(Delivered)

No. 1 cupola cast	46.00
Heavy breakable	45.00
Charging box cast	47.00

San Francisco
(Delivered)

No. 1 cupola cast	41.00

St. Louis
(Delivered)

No. 1 cupola	41.00
Stove plate	39.00
Unstripped motor blocks	35.00

HAMILTON, ONT.
(Delivered Prices)

Heavy Melt	$35.00
No. 1 Bundles	35.00
No. 2 Bundles	35.00
Mechanical Bundles	31.50
Mixed Steel Scrap	31.00
Mixed Borings, Turnings	32.00
Rails, Remelting	35.00
Rails, Rerolling	38.00
Busheling	29.50
Bushelings new fractory:	
Prep'd	33.00
Unprep'd	31.00
Short Steel Turnings	32.00
Cast Iron Grades*	
No. 1 Machinery Cast	50.00

* F.O.B. shipping point.

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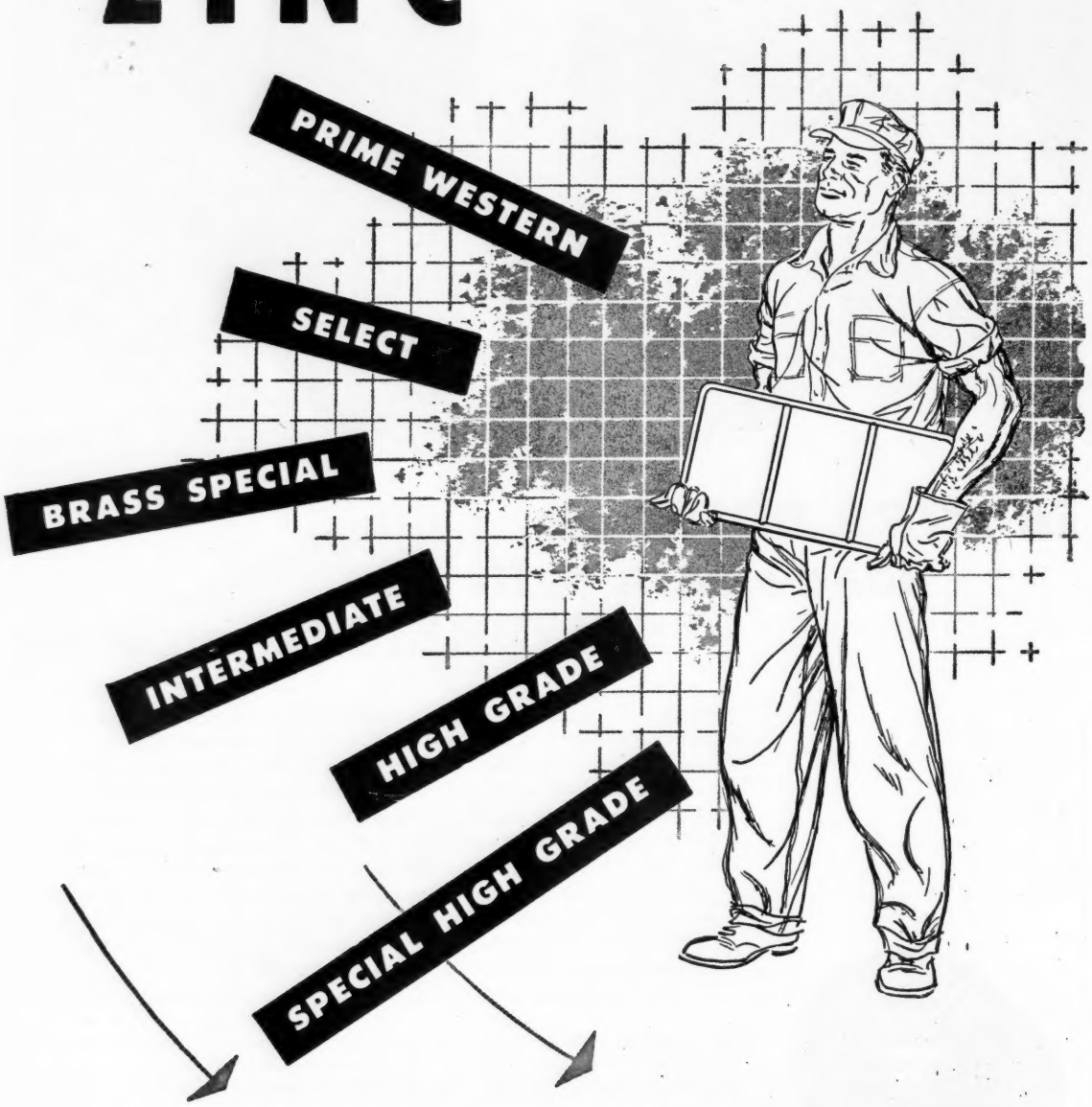

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The Metal Market

Happy smiles were worn by Reynolds Metals Co.'s R. S. Reynolds, left, and GSA-DMPA's Jess Larson when Reynolds' sprawling new 80,000-ton San Patricio, Tex., aluminum reduction plant rumbled into official operation May 15. While the civilian supply picture brightens almost daily, an interagency squabble over further aluminum expansion is reaching a head in Washington. Mr. Larson, strong backer of the near-700,000-ton expansion program now coming into production, believes we'll be self-sufficient in aluminum without adding further capacity. That position is opposed by DPA's Samuel Anderson and others who want to accelerate the accumulation of a military stockpile of about 2.5 million tons

Wrangle over further aluminum expansion and where reaches a head. Stockpile needs set at 2.5 million tons and accumulation at present rate is for about 1 million tons

THE NATIONAL stockpile of metals will loom large in the supply picture this year. With the government attempting to establish military needs in event of full-scale war and to estimate civilian requirements for the next decade, the stockpile becomes a potent factor.

Aside from serving as a military hoard, the stockpile and its functioning have diverse effects on availability and even prices of metals. Withdrawals of needed materials helped nonessential fabricators keep their heads above water last year. Buying has spurred exploration and development of strategic materials.

Shotgun Wedding—Use as a weapon to settle price disputes is illustrated by tin contracts with Indonesia and the Belgian Congo. It was about to work with Bolivia, but revolution there upset negotiations.

In copper, the stockpile is in no shape to support industry indefinitely while a settlement is negotiated. That's why a price agreement is being rushed and appears imminent.

Split of Opinion—Stockpile needs are also at the root of government arguments over further capacity expansion in aluminum. Samuel Anderson, DPA Deputy Administrator for Aluminum, believes a 2.5 million ton hoard necessary. At one time, the aluminum stockpile needs were set as high as 4 million tons.

Mr. Anderson is now officially a supporter of a third round of aluminum expansion; Manly Fleischmann, to whom he submitted the recommendation, should act within the week. Informed sources say he favors the expansion by Aluminum Co. of Canada that would mean a net addition to our aluminum supply of about 70,000 to 75,000 tons. Jess Larson, GSA-DMPA, says present programs will be sufficient for our aluminum needs.

New Face?—At home, Mr. Anderson recommends authorizing new facilities to the extent of about 75,000 to 80,000 tons annual capacity. A new producer is still being sought for the job, to the distress of Alcoa, Reynolds and Kaiser. Reported interested in the job are Olin Industries, Spartan Aircraft Co., Kennecott Copper Co. and American Smelting & Refining Co.

Authorization of further expansion of present primary producers (Alcoa's twin 200,000 ton Taiya, Alaska, projects; Reynolds' doubling its Lister Hill, Ala., facilities to 95,000 tons yearly; Kaiser's enlarging its New Orleans Chalmette plant) was not recommended, "unless no suitable alternative is available."

Says Mr. Anderson: "I doubt that, with our present supplies, we will in the next few years succeed in stockpiling as much as a million tons without unduly prolonging controls and engaging in a degree of competition with civilian economy as well as subsidizing of high cost metal for a long period."

Controls Reins Loosen

The reins of controls on many metals are loosening but don't expect them to be severed entirely. Washington wants to be able to use them again in case of emergency. First steps to decontrol are allocations higher than use. Then comes liberalization or removal of inventory limitations. The procedure can be seen in the belated removal of inventory controls on lead, antimony, bismuth and cadmium by NPA. At the same time inventory limitations on zinc were loosened.

Tin Price Vulnerable

Tin prices abroad may be the next to get the hatchet. Britain's sale of 20,000 tons of tin to RFC is being fulfilled by buying on the Singapore market. Trade sources say this buying will be completed by mid-June—well ahead of schedule because of soft world demand. Surprisingly, U. S. imports of tin in 1951 about balanced consumption, despite the RFC buying strike.

Nonferrous Briefs

Hydrogen-reduced tungsten and molybdenum wire, rods, sheets, metal powder and other products are in oversupply and allocation discontinuance is being urged.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c, Conn. Valley Lake 24.62½c, delivered.

Brass Ingots: 85-5-5-5 (No. 115) 27.25c, 88-10-2 (No. 215) 40.00c; 80-10-10 (No. 305) 33.00c; No. 1 yellow (No. 405) 23.25c.

Zinc: Prime western 19.50c; brass special 19.75c; intermediate 20.00c, East St. Louis; high grade 20.85c, delivered.

Lead: Common 14.80c; chemical nom.; corroding 14.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 19.00c, pigs 18.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 20.50c; No. 12 foundry alloy (No. 2 grade) 19.50c; steel deoxidizing grades, notch bars, granulated or shot; Grade 1, 18.80c; grade 2, 18.60c; grade 3, 18.40c; grade 4, 18.20c.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 121.50c.

Antimony: American 99-99.8% and over but not meeting specifications below 39.00c; 99.8% and over (arsenic 0.05% max., other impurities 0.1% max.) 39.50c; f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 56.50c; 25-lb pigs, 59.15c; "XX" nickel shot, 60.15c; "F" nickel shot or ingots, for addition to cast iron, 56.50c. Prices include import duty.

Mercury: Open market, spot, New York, $200-$204 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $1.56 per lb of alloy, f.o.b. Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2.25 del.; special or patented shapes $2.46.

Cobalt: 97.99%, $2.40 per lb for 500 lb (kegs); $2.42 per lb for 100 lb (case); $2.47 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 84.00c per oz.

Platinum: $102-$105 per ounce from refineries.

Palladium: $25 per troy ounce.

Iridium: $200 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Ceiling prices, cents per pound, f.o.b. mill, effective Aug. 23, 1951)

Sheet: Copper 41.68; yellow brass 38.28; commercial bronze, 95% 41.61; 90% 41.13; red brass, 85% 40.14; 80% 39.67; best quality, 39.15; nickel silver, 18%, 53.14; phosphor-bronze grade A, 5%, 61.07.

Rod: Copper, hot-rolled 37.53, cold-drawn 38.78; yellow brass free cutting, 32.63; commercial bronze 95%, 41.30; 90% 40.82; red brass 85%, 39.83; 80%, 39.36.

Seamless Tubing: Copper 41.72; yellow brass 41.29; commercial bronze, 90%, 43.79; red brass, 85%, 43.05.

Wire: Yellow brass 38.57; commercial bronze, 95%, 41.90; 90%, 41.42; red brass, 85%, 40.43; 80%, 39.96; best quality brass, 39.44.

(Base prices, effective Dec. 26, 1951)

Copper Wire: Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 28.545; 30,000 lb lots, 28.67; l.c.l., 29.17. Weatherproof, 100,000 lb, 30.35; 30,000 lb, 30.60; l.c.l., 31.10. Magnet wire del., 15,000 lb or more, 34.50; l.c.l., 35.25.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders)

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	30.1	...	...
0.135-0.096	12-48	30.6	...	...
0.095-0.077	12-48	31.2	29.1	33.2
0.076-0.061	12-48	31.8	29.3	33.4
0.060-0.048	12-48	32.1	29.5	33.7
0.047-0.038	12-48	32.5	29.8	34.0
0.037-0.030	12-48	32.9	30.2	34.6
0.029-0.024	12-48	33.4	30.5	35.0
0.023-0.019	12-36	34.0	31.1	35.7
0.018-0.017	12-36	34.7	31.7	36.6
0.016-0.015	12-36	35.5	32.4	37.6
0.014	12-24	36.5	33.3	38.9
0.013-0.012	12-24	37.4	34.0	39.7
0.011	12-24	38.4	35.0	41.2
0.010-0.0095	12-24	39.4	36.1	42.7
0.009-0.0085	12-24	40.6	37.2	44.4
0.008-0.0075	12-24	41.9	38.4	46.1
0.007	12-18	43.3	39.7	48.2
0.006	12-18	44.8	41.0	52.8

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or distance across flats	—Round— R317-T4	R-317-T4	—Hexagonal— 17S-T4
0.125	52.0	....	....
0.156-0.0188	44.0	....	....
0.219-0.313	41.5	....	....
0.375	40.0	46.0	48.0
0.406	40.0	....	....
0.438	40.0	46.0	48.0
0.469	40.0	....	....
0.500	40.0	46.0	48.0
0.531	40.0	....	....
0.563	40.0	....	45.0
0.594	40.0	....	....
0.625	40.0	43.5	45.0
0.688	40.0	....	45.0
0.750-1.000	39.0	41.0	42.5
1.063	39.0	....	41.0
1.125-1.500	37.5	39.5	41.0
1.563	37.0	....	....
1.625	36.5	....	39.5
1.688-2.000	36.5	....	....

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $20.00 per cwt; add 50c cwt 10 sq ft to 140 sq ft. Pipe: Full coils $20.00 per cwt. Traps and bends: List prices plus 50%.

ZINC

Sheets 26.50c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 25.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 25.50c-26.50c; over 12-in., 25.50-26.50c.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 77.00c. Strip, cold-rolled, 83.00c. Rods and shapes, 73.00c. Plates, 75.00c. Seamless tubes, 106.00c.

MONEL

(Base prices f.o.b. mill)

Sheets, cold-rolled 60.50c. Strip, cold-rolled 63.50c. Rods and shapes, 58.50c. Plates, 59.50c. Seamless tubes, 93.50c. Shot and blocks, 53.50c.

MAGNESIUM

Extruded Rounds 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads, 28.00c; 5 tons and over 28.50c; 1 to 5 tons, 29.00c; less than 1 ton 29.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat, rolled, 38.34c; oval 37.84c.

Nickel Anodes: Rolled oval, carbonized, carloads, 74.50c; 10,000 to 30,000 lb. 75.50c; 3000 to 10,000 lb, 76.50c; 500 to 3000 lb 77.50c; 100 to 500 lb, 79.50c; under 100 lb, 82.50c; f.o.b. Cleveland.

Nickel Chloride: 36.50c in 100 lb bags; 34.50c in lots of 400 lb through 10,000 lb; 34.00c over 10,000 lb, f.o.b. Cleveland, freight allowed on 400 lb or more.

Sodium Stannate: 25 lb cans only, less than 100 lb to consumers 86.7c; 100 or 350 lb drums only, 100 to 600 lb 71.60c; 700 to 1900 lb, 69c; 2000 to 9900 lb, 67.3c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Tin Anodes: Bar, 1000 lb and over, $1.375; 500 to 999 lb, $1.38; 200 to 499 lb, $1.385; less than 200 lb, $1.40. Freight allowed east of Mississippi and north of Ohio and Potomac.

Zinc Cyanide: 100 lb drums, less than 10 drums 54.30c, 10 or more drums, 52.30c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb $1.11; more than 2000 lb, $1.09. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Stannous Chloride (Anhydrous): In 400 lb bbl, 98.5c; 100 lb kegs 99.5c. Freight allowed.

Scrap Metals

Brass Mill Allowances

Ceiling prices in cents per pound for less than 20,000 lb, f.o.b. shipping point, effective June 26, 1951.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.50	21.50	20.75
Yellow Brass	19.125	18.875	17.875
Commercial Bronze			
95%	20.50	20.25	19.75
90%	20.50	20.25	19.75
Red Brass			
85%	20.25	20.00	19.375
80%	20.125	19.875	19.375
Muntz metal	18.125	17.875	17.375
Nickel silver, 10% ..	21.50	21.25	10.75
Phos. Bronze, 5% ...	25.25	25.00	24.00

Copper Scrap Ceiling Prices

(Base prices, cents per pound, less than 40,000 lb f.o.b. point of shipment)

Group 1: No. 1 copper 19.25; No. 2 copper wire and mixed heavy 17.75; light copper 16.50; No. 1 borings 19.25; No. 2 borings 17.75; refinery brass, 17.00 per lb of dry Cu content for 50 to 60 per cent material and 17.25 per lb for over 60 per cent material. Group II: No. 1 soft red brass solids 18.50; No. 1 composition borings 19.25 per lb of Cu content plus 63 cents per lb of tin content; mixed brass borings 19.25 per pound of Cu content plus 60 cents per lb of tin content; unlined red car boxes 18.25; lined red car boxes 17.25; cocks and faucets 16.00; mixed brass screens 16.00; zincy bronze solids and borings 16.25.

Zinc Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment)

Unsweated zinc dross, 13.75c; new clippings and trimmings, 15.50c; engravers' and lithographers' plates, 15.50c; die cast slabs, min. 90% zinc, 13.75c; old zinc scrap, 12.25c; forming and stamping dies, 12.25c; new die cast scrap, 11.75c; old zinc die cast radiator grille, 11.50c; old die cast scrap, 10.50c.

Aluminum Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment, less than 5000 lb)

Segregated plant scrap: 2s solids, copper free, 10.50; high grade borings and turnings, 8.50; No. 12 piston borings and turnings, 7.50; Mixed plant scrap: Copper-free solids, 10.00; dural type, 9.00. Obsolete scrap: Pure old cable, 10.00; sheet and sheet utensils, 7.25; old castings and forgings, 7.75; clean pistons, free of struts, 7.75; pistons with struts, 5.75.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Lead: Heavy 13.00-13.25; battery plates 8.50-8.75; linotype and stereotype 15.50-16.00; electrotype 14.00-14.50; mixed babbitt 15.50-15.75.

DAILY PRICE RECORD

1952	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
May 20-22	24.50	14.80	19.50	121.50	19.00	39.00	56.50	84.00
May 16-19	24.50	14.80	19.50	121.50	19.00	44.00	56.50	84.00
May 15	24.50	14.80	19.50	121.50	19.00	44.00	56.50	85.00
May 13-14	24.50	14.80	19.50	121.50	19.00	44.00	56.50	86.00
May 12	24.50	14.80	19.50	121.50	19.00	44.00	56.50	87.00
May 6-10	24.50	16.80	19.50	121.50	19.00	44.00	56.50	87.00
May 2-5	24.50	16.80	19.50	121.50	19.00	44.00	56.50	88.00
May 1	24.50	17.80	19.50	121.50	19.00	44.00	56.50	88.00
Apr. Avg.	24.50	18.723	19.50	121.50	19.00	49.077	56.50	88.00
Mar. Avg.	24.50	18.80	19.50	121.50	19.00	50.00	56.50	88.00
Feb. Avg.	24.50	18.80	19.50	121.50	19.00	50.00	56.50	88.00
Jan. Avg.	24.50	18.80	19.50	109.404	19.00	50.00	56.50	88.00

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

Steel Bars . . .

Bar Prices, Page 153

Chicago—For some time, the increasing shortage of hot-rolled carbon and quality bars has been attributed to the mounting requirement of military programs. In the case of shells, contractors are receiving directed shipments much in excess of use and inventories are expanding and now average six months' needs or more. Fuses require free-machining resulphurized steel which is not too widely produced normally and an actual shortage does exist in that type of steel.

Boston—Bar mills producing resulphurized grades are sold through third quarter, with some tickets for that period unplaced. Electric furnace aircraft quality bars are also well sold ahead. Any easing in carbon bars is spotty, hardly a trend even in smaller sizes. For weeks forge shops have been getting liberal allotments; slight easing in pressure indicates inventories are higher. Bolt producers are also better supplied. Although opened on alloys for fourth quarter, most producers are not filled for that period.

New York—Active demand persists for carbon bars in practically all shapes and sizes. Leading producers are booked up solidly for the third quarter, except for some allowances for top priority defense needs. There is strong pressure for cold-finished bars as well as hot-rolled. Some cold-finishers are booked into fourth quarter. Cold alloy bar producers are also moving into fourth quarter, although the situation in hot alloys is relatively easier. Some producers can still promise shipments for late August.

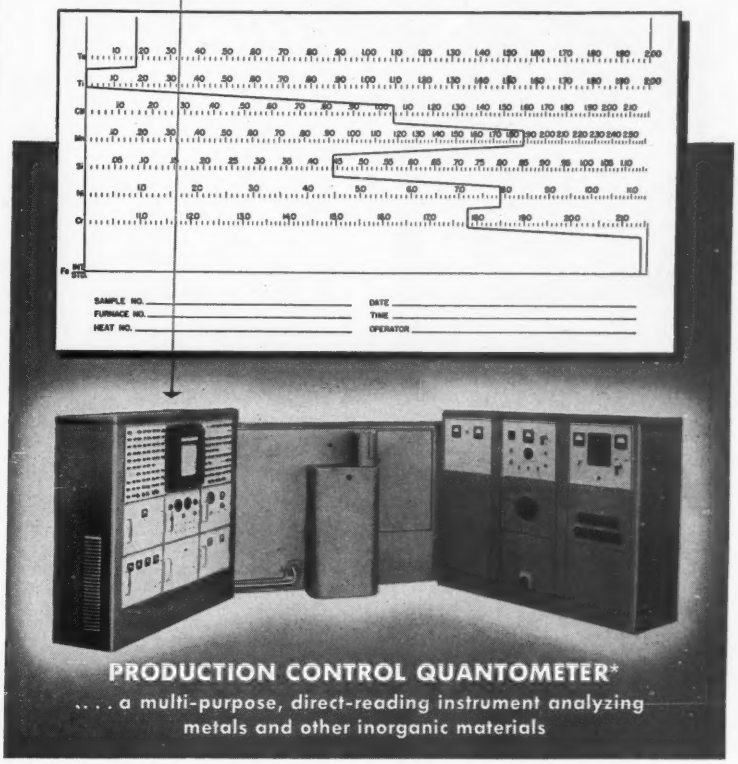
Philadelphia—Hot carbon bar consumers report continued difficulty in obtaining added tonnage. Actually, most find themselves stymied when it comes to placing new orders. Producers are well booked up through the third quarter and have not opened books for shipment beyond. However, the great bulk of consumer requirements have already been specified for the next few months. Buyers of cold finished carbon bars report continued stringency, although they are finding mills which will accept tonnage for shipment beyond third quarter.

Pittsburgh—No let-up in the heavy demand for bars has been noted in this market. Automotive and the military are sustaining capacity operations on district mills. Producers are back an average of six weeks' production due to the steelworkers' walkouts and see no chance of catching up until well into fourth quarter of this year. Many buyers hoping to find open rolling time are being turned away daily. Tightness is more noticeable in the carbon grades than in the alloy classifications. Books are completely filled through third quarter and it seems reasonably certain that excellent production will continue for the rest of the year. The larger size hot-rolled and cold-finished material is the most difficult to get in this district.

Washington—Bar supplies for civilian production will be further decreased when a new set-aside program to help meet pressing military

THE INSIDE STORY ON STAINLESS STEEL

Shown below is a multiple-copy graphic record of a typical stainless steel chemical analysis made on an ARL Production Control Quantometer.* Accurate percentages of elements present in the alloy are recorded permanently in pen-and-ink in less than two minutes! And steel is only one of many metals and inorganic compounds which the unique ARL Quantometers are controlling daily as to routine chemical analysis in many types of industries.



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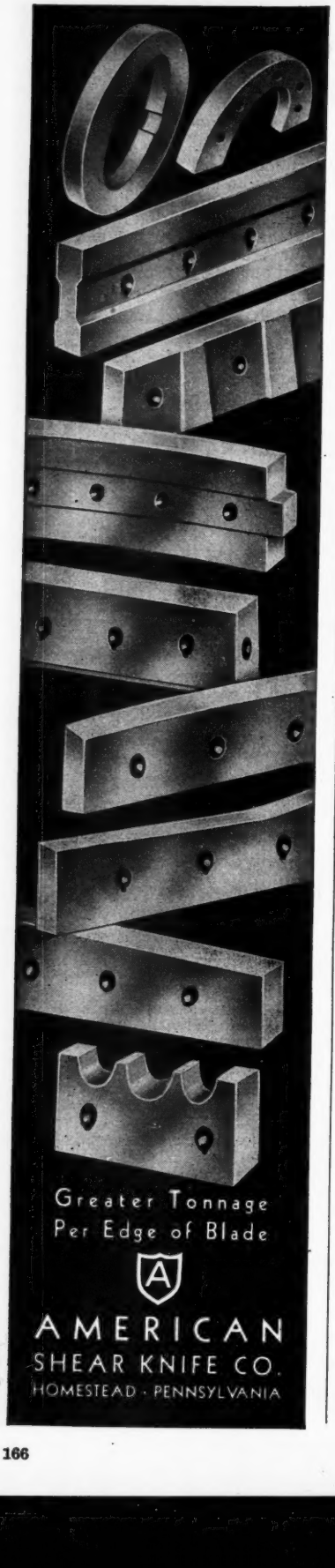

needs becomes effective Aug. 1. The ammunition program is reported greatly in arrears, current output being sufficient only for battlefield needs.

Cleveland — Carryover of unfilled carbon bar orders to June will be equivalent to about 30 days' production. If schedules are disrupted again by a walkout of workers following the forthcoming decision by the Supreme Court, mills may not be able to ship all of the tonnage promised for the third quarter. Books for that period are well filled and those for the fourth quarter will not be opened until mid-August.

Sheets, Strip . . .

Sheet and Strip Prices, Page 153 & 154

New York—Interest in hot-rolled and cold-rolled sheets is quickening. There is not the pressure for them that prevails for bars, shapes and heavy plates, but buying is more active than a month or so ago. This may be ascribed in part to the recent relaxation in consumer credit on automobiles and other consumer items and also to the recent loss of steel from strikes and the threat of still more strikes. Galvanized sheets are active. Most producers are booked up for the third quarter. Low grade silicon sheets and straight chromium sheets are in easy supply.

Boston—Inventory liquidation and adjustment on flat-rolled has about run out. Nevertheless, nonpremium producers are scheduled through third quarter on carbon sheets. Cold strip is slow and some converters are not taking all hot-rolled carbon and alloy allotments. High-rated tickets are needed to obtain nickel-bearing stainless, but orders for straight chromium stainless are easily placed.

Philadelphia — Sheet demand is tightening a bit. There are fewer deferments and cancellations and there is a general disposition to specify more actively than a few weeks ago. Further strike threats may have something to do with this, as well as relaxation of credit controls on consumer hard goods. Some of the larger producers of hot-rolled and cold-rolled sheets claim they have no capacity left in third quarter for other than top-rated defense business.

Pittsburgh—Automotive demand is holding up well and will help keep cold-rolled production at high levels. Approximately a month's carryover into third quarter will be due to the two work stoppages of the steelworkers' union. Cancellations to date have been negligible. With third-quarter books closed it looks like good business for the rest of the year. Hot-rolled is tighter than cold-rolled and galvanized is holding up well. Strip is firm but mills say that some sizes may weaken before the end of the fourth quarter. Long ternes are in good balance and silicon steel could stand some improvement in ordering, as production is at the 80-85 per cent level.

Chicago—Earlier easing in demand for both hot-rolled and cold-rolled sheets has disappeared. Demand from consumers currently is active and mills are booked solidly for second quarter. No diminution in orders is yet evident for third quarter.

Tubular Goods . . .

Tubular Goods Prices, Page 157

San Francisco — Black buttweld pipe is in pretty good supply, but galvanized buttwelded pipe still is hard to obtain despite the increased zinc allotment. Seamless pipe, likewise, is in the hard-to-get category. Steel pipe supply firms in Arizona report fair access to pipe needed for irrigation, but many have informed the San Francisco office of the NPA they would like to get larger shipments. These supply firms have been getting all the pipe they were entitled to by NPA rules, but they have depleted their inventories to about 25 per cent of last year's sales on the average. Some had entirely cleared their stocks.

Boston—Most distributors of buttweld pipe carry balanced inventories, but relatively few are passing up allocations for July. Larger size merchant pipe and seamless are tight with direct shipments through third quarter well filled. Producers are opening July 1 for fourth quarter on tubing specialties. Pipe shipments to Boston area from as far as Pittsburgh have been made recently. Only tubular product definitely easy is light tubing, with deliveries down to four weeks in some cases.

Cleveland — Mills are about two weeks behind schedule in making shipments of pipe as a result of the recent shutdowns. July quotas may be cut to eliminate the arrearages, but producers would like to await, if possible, developments following the Supreme Court's decision in the steel case. Pipe mills in this district are accepting some orders for fourth-quarter delivery.

Plates . . .

Plate Prices, Page 153

Boston—Large integrated flanging shops are operating at full capacity, but small plate shops are inclined to lag with competition sharper. Still hard to place are quality plates in wider and heavier sizes, also low alloy high tensile specifications. Strip mill production has caught up with demand for light material and some users will not take narrow plates. More tonnage will go to shipyards in third quarter. Deliveries on spun heads range from nine to 11 weeks, with smaller pressed circles eight weeks and larger diameters 14 weeks.

New York—Some sellers of sheared plate, who are booking on a monthly basis, have not opened their books for September, but others, who are on a quarterly basis, have little or no capacity left for the third period. The only exceptions are a few scattered mills which are quoting particularly high premiums. As has been the case for some months, the heavy gages are in strong demand. Strip plate, on the other hand, is moving only moderately well. Consumers of it have little difficulty obtaining shipments for July and early August.

Philadelphia—Pressure is still on for heavy gage plate, particular ½-inch and heavier. Atomic energy needs are active and an increasing tonnage is coming out for ship work. One feature of this latter demand is

a stepping up in specifications for plates for strapping a number of cargo ships which have been inactivated since World War II. This strapping is to provide added strength. Plates are placed inside the hull and generally range from 36 to 48 inches in width and around ⅜-inch in thickness. Utilities are taking an increasing amount of heavy plate for heat exchangers and power boilers. Oil refinery requirements are still strong.

Pittsburgh—Wide, heavy material is still most difficult to obtain in this area. The narrower, lighter gage stock which is being rolled on continuous hot-strip mills is in much better supply and is easily obtainable from some mills. Producers have revamped their estimates of lost production due to the steelworkers' walkouts to at least 5-6 weeks. With books completely filled through third quarter it now appears that business will continue in high gear until the year's end.

Tin Plate . . .

Tin Plate Prices, Page 154

Pittsburgh—Mills are waiting for decontrol of secondary mill products and easier quota restrictions under container Order M-25. Demand looks somewhat better but it still is relatively light. Consumers do not seem much concerned over possibility of another work stoppage if the Supreme Court rules in favor of the steel producers. Reason for the consumer complacency is believed to be the favorable inventories held by most users, notably the canmakers.

Structural Shapes . . .

Structural Shape Prices, Page 153

New York — National Production Authority approved construction of a number of large commercial projects in Region 2, which comprises this city and sections of New York state and New Jersey. This is in line with NPA's policy in relaxing its building controls in various sections. Recently it approved civilian construction for the country as a whole to the extent of $337 million, involving more than a thousand commercial, religious, community and municipal building projects. About 300 projects, costing $177 million, involving office buildings, stores and other sizable structures, were put aside for the present time.

Philadelphia — District structural demand is spotty, with no outstanding awards and with inquiry comprised mostly of bridge work. Small fabricating shops are badly in need of business and are whittling prices on such work as is coming out.

Boston—Mills rolling junior beams are well filled through third quarter; limited volume of wide-flanged sections contributes toward some lack of balance in shop inventories, but overall tonnage going to fabricators is somewhat improved. Except for bridges, new inquiry for fabricated tonnage is light.

Pittsburgh—Although some easing has been felt for some time in the market, business will continue good for structural mills due to filled order books and a backlog of six weeks' lost production caused by the two

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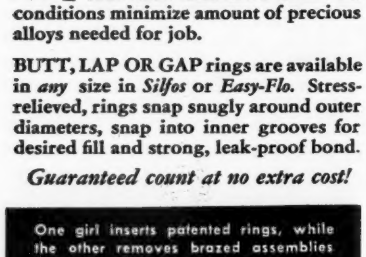

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walkouts of the steelworker's union. Mills will enter the fourth quarter with approximately 1½ months' unfinished orders. With expected new business coming from public works and commercial building projects, mills are optimistic that full rolling schedules can be maintained until the year's end. The larger flanged sections are the hardest to find in this producing area.

Washington—Further relaxations of construction regulations beginning third quarter, just announced by NPA, permit limited amounts of entertainment and amusement project building, and use of some structural steel in housing.

Detroit—Construction workers' strike has resulted in enough steel being piled up to keep jobs going without further replenishment long after the strike's settlement. The push to get several important defense projects further along before the strike deadline was generally futile.

Chicago — New industrial building projects and plant expansions are not developing as rapidly as originally anticipated. Many fabricating shops probably will not be fully booked by latter part of the year since demand for structural shapes is waning somewhat. Larger sections are still tight, but smaller ones are in a more generous supply.

Seattle — Structural fabricators as a whole have better than normal backlogs, although some plants are in need of new third-quarter business. Competition seems to be increasingly keen, some fair-sized contracts having been taken by outside plants.

Pig Iron . . .

Pig Iron Prices, Page 152

Washington—Inventory controls on materials for the pig iron industry will be eliminated entirely or the 60-day inventory limit will be increased to a 90-day supply, if NPA follows recommendations of the Merchant Pig Iron Industry Advisory Committee. Production of merchant pig iron, based on present and planned facilities, will be more than ample to meet any foreseeable demand, the industry says.

Use of better raw materials and improvements in operations are expected to account for about a 3 per cent annual increase in production by existing facilities. Production of pig iron by the steel industry, which usually accounts for about 40 per cent of the output of merchant iron, is expected to increase proportionately.

Boston—Foundry melt is estimated at about 70 per cent of 1951 level, with most large consumers affected. Demand for machine tools appears brightest spot. Mystic furnace, back in production, is operating on malleable currently. Defense contracts placed are not helping gray iron shops, a minimum of castings being needed for most products.

New York—Pig iron demand and supply are in fair balance. District gray iron foundry operations are still lagging, although they seem to have leveled off. Consequently, there is not any severe pressure of demand, especially as some consumers have been able to build up their inventories. Metallurgical coke is in free supply.

Philadelphia—Pig iron demand is definitely easier. Basic is active, but foundry grades are not moving too well.

Pittsburgh—Even though the demand for merchant iron has not been too good for months, the district's only commercial stack has no trouble disposing of its output. Tightening effect on the market due to the steelworkers' strikes will pass slowly unless the consumer casting business takes a turn for the better, as many authorities think is possible with the improved building schedules in prospect. All stacks except those being repaired are back in production. Furnace No. 4 at U. S. Steel's Duquesne Works was blown in on May 10 after a relining job.

Detroit — Foundries normally supplied by Interlake's Toledo blast furnaces are reducing operations to conserve iron. When the strike started in April, many had about 30 days' supply. Some have reached out for Canadian and southern iron, but freight premiums make these efforts expensive expedients. Foundry operations generally here are somewhat lower in spite of improvement in auto production. Construction of a new blast furnace for Great Lakes Steel is held up by the strike of construction workers and this unit likely will not come into operation in June as planned.

Chicago—Pig iron retained the renewed tightness which developed through loss of tonnage in the two recent steel strikes. Available tonnage is closely allocated by suppliers. No serious shortage exists, since foundries have sufficient inventory to accommodate present melting rate which is spotty and well below full capacity. In a few days, Youngstown Sheet & Tube Co. will relight its South Chicago No. 3 stack which went down Apr. 4 for relining.

Los Angeles—Foundry activity is up about 10 per cent due to easing of building and materials controls. Melters say customers are pressing for closer delivery for the first time in eight months. Pig iron is plentiful at ceiling prices.

Iron Ore . . .

Iron Ore Prices, Page 159

Cleveland — Interruptions to blast furnace operations last month due to labor disputes caused a drop in iron ore consumption in April to 6,616,196 tons from 8,022,214 tons in March. This brought the total for the first four months to 29,394,868 tons, compared with 28,368,680 tons in the like period a year ago.

Total number of furnaces has increased to 197, including the new No. 6 for Republic Steel Corp. at Cleveland.

Total stocks of iron ore at furnaces and on Lake Erie docks declined to 19,591,854 tons as of May 1 from 21,451,105 tons a month earlier. Compared with stocks a year ago, there is a sharp increase from 15,071,767 tons. Shipments are being received at about the same rate as a year ago, having totaled 2,916,794 tons for the week ended May 19 and 13,416,169 tons for the season to that date.

More Steel Comes from Japan

Seattle—Importing houses dealing in Japanese steel report that sheets and plates are not being offered freely but considerable quantities of structurals and reinforcing steel are coming from Nipponese sources. Much of it is being absorbed in the British Columbia market which also is importing steel items from Great Britain and Belgium. Japanese steel products are high-priced due to the cost of raw materials.

Scrap . . .

Scrap Prices, Page 160

Chicago—Scrap demand is lighter. Only open-hearth and heavy melting steel grades hold interest of mills and even here source and quality of dealer offerings are checked before acquisition. Inspection is rigid. Mills' inventories range 30 to 60 days' needs despite full capacity steelmaking oprations. Weakness is developing in No. 1 and No. 2 bundles, as well as machine shop turnings, with some sales reported at $2 below ceilings. The auto wrecking program, which is producing much light sheet material of No. 2 bundle category and cast grades, is responsible for some of the sluggishness. Tightened supply of pig iron failed to strengthen foundry demand for cast material which is in overabundant supply and moving well below ceiling prices.

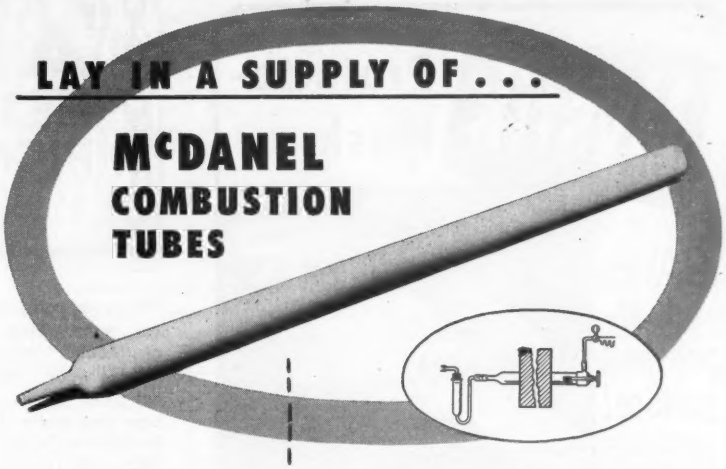
Boston—Steel scrap yard inventories are heavier. Shipments to consumers are fairly steady at ceiling prices, but pressure for deliveries has eased. Demand for cast scrap is light, and on small lots moved, mostly by truck, prices have sagged further, notably on No. 1 cupola cast and motor blocks. They now are well under ceilings.

Philadelphia—While prime grades of open-hearth scrap are in good demand, the situation in scrap otherwise is rather sluggish. Low phos is plentiful and cast grades generally are in easy supply. Cupola is off slightly to $40 to $41, delivered, although unstripped motor blocks are unchanged at $35, and seem fairly steady at that level. Heavy breakable cast has dropped on representative buying to $42, delivered, from the $45 f.o.b. shipping point ceiling price.

Pittsburgh—The market is slow and some dealers think lower prices can be expected in the next month; others say prices should remain firm as none of the yards seem to have any available supply. Open-hearth material is still being moved to district steelmakers, but dealers report that electric furnace grades are harder to sell. It is almost impossible to sell turnings and the cast grades. What cast is moving is between $4 and $6 a ton under established ceilings. Dealers report somewhat better receipts of incoming material but it is nothing to become elated about.

Cleveland—Buying interest in blast furnace grades of scrap is negligible. After small purchases of turnings at $2 to $3 a ton under ceilings, buyers withdrew. Cast grades also are weak pricewise with No. 1 cupola cast quoted at $44 without attracting buyers.

Detroit—High operating rate of the steel mills is being achieved with-



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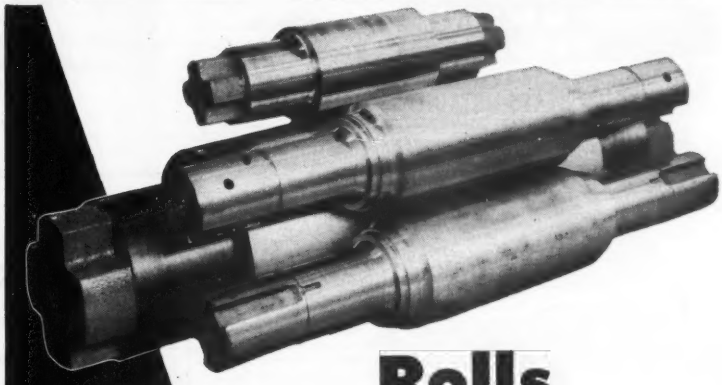

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out sizable dents being made in scrap stocks. These are higher than they have been for many months, being helped by the brief strike and recovery period. Although some foundries are in need of pig iron, cast scrap grades as yet are not under noticeable pressure, one reason being that the iron-to-scrap ratio does not permit much juggling.

Youngstown—Further signs of an easing in the critical scrap shortage that had threatened for a time last winter to shut down part of the Youngstown steel industry are noticed.

Steel companies are much more selective in their scrap buying, and considerable scrap is reported piling up in dealers' yards. Some mills even are holding back on deliveries to await results of the U. S. Supreme Court decision in the steel union case.

Mills are rejecting scrap that is not up to grade.

St. Louis—Prices of both cast and open-hearth scrap have steadied at a low level. A $2 springboard and dealer absorption of the latest freight rate rise still prevail on melting steel sales at ceiling. No. 1 cast holds at $41 a gross ton and unstripped motor blocks at $35. Cast orders from foundries are virtually non-existent since most have close to 30-day stocks.

Los Angeles—With 60 per cent of cast scrap sold in this district taken by soil pipe foundries, and those foundries' pourings up by 50 per cent, trade observers see an eventual firming of the price of cast scrap material, which has slipped now to a low of $8 to $10 below ceiling.

San Francisco—One of the largest foundries here reported it could buy all the No. 1 cupola cast it wanted at $41 a gross ton, delivered. That would be $1 a ton below the generally accepted going rate of $42 a ton in effect the last several weeks. Foundries, generally, are taking a little more cast iron scrap, indicating slight pick-ups in their casting work. In open-hearth grades, materials are flowing a bit more slowly as a result of the $5 slash below ceiling in the buying price for No. 2 bundles. Shipments appeared to be coming in ahead of schedule and the price reduction had a "sobering" effect as mills saw no need to buy all the scrap at once.

Seattle—Steelmaking scrap is arriving in ample volume for current needs, and mills will be able to add to inventories if the flow continues. Cast iron is almost a drug on the market. The South Pacific and Hawaii continue as good sources of supply, while shipments from Alaska are expected as soon as weather permits. A full cargo of about 9000 tons scrap from Hawaii to the North Atlantic is reported closed on a basis of approximately $12 a ton freight.

Canada . . .

Toronto, Ont.—Canada made new high monthly records in production of both pig iron and steel in March.

Pig iron production in March, at 93.7 per cent of rated capacity, totaled 240,755 net tons, compared with 199,162 or 82.8 per cent in February. Output in March included 182,937 tons of basic iron, 20,662 tons of foundry iron and 37,156 tons of malleable iron.

Production of steel ingots and castings in March totaled 339,396 net tons. This was at a rate of 101.5 per cent of capacity.

Toronto, Ont.—Canadian production of primary iron and steel shapes in February amounted to 415,738 net tons, compared with 437,287 tons in January.

Shipments for sale of primary iron and steel shapes in February amounted to 261,814 net tons.

Warehouse . . .

Warehouse Prices, Page 159

Boston—Nail prices are off 50 cents a keg, but otherwise warehouse prices are holding. Heavier hot-rolled products are in unbalanced supply, and some shipments are delayed by production losses. Warehouse operators are girding for more competitive selling, strengthening sales organizations; two larger distributors have named new sales managers, hired in both cases from district mill sales offices.

Philadelphia — Jobbing demand so far this month is down slightly from April on a daily average basis. Bars and heavy plates are in particularly strong demand and good business is noted in shapes. In most other products, except coated sheets, demand is less pressing.

Pittsburgh — Consumer demand is reported as good in this district. Operators say they cannot give good service to all the inquiries received, as the problem of unbalanced stocks is getting no better. Mill shipments are described as fair but warehousemen are back about five weeks in their receipts. Wide and heavy plates, some of the larger structural sections, hot-rolled and cold-finished bars in the larger sizes, seamless tubing and some nickel stainless compositions are extremely hard to obtain in the western Pennsylvania area.

St. Louis—Warehouses are having increased trouble with imbalances in inventories. Stocks are good but sizes are badly broken. In the face of increased demand, plate deliveries have fallen, with the result they are the tightest warehouse item in this area. Next are cold-finished bars in sizes over 1 inch. Cold sheets are in fair supply. Still to be felt is an expected pickup in galvanized roofing sales following easing of zinc scarcities at mills.

Los Angeles—Fabricators are not indulging in inventory buying as they did in the past strike periods. This lends warehousemen to speculate that customers think their steel stocks are in good shape to withstand possible strike-caused shortages. Distributors report they are well-stocked in bars and cold-rolled sheet and strip. Only galvanized sheet is still in tight supply.

Seattle—Demand at warehouses is slightly softening. Business is reported spotty, some buyers seemingly postponing purchases until the steel wage controversy is settled. Mills are behind in deliveries and jobbers believe strike conditions will result in a 30-day loss of production and sales. Inventories are low and unbalanced. A gradual drift into a buyer's market is seen by some observers. The 15 per cent freight increase granted railroads and the

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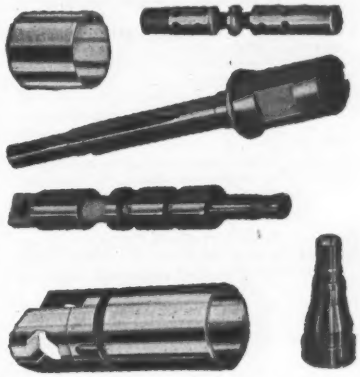

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water lines may be reflected in an upward revision of jobbers' lists. Hot-rolled sheets and plates continue in extremely short supply. Large-size structurals and I beams are tight, wide flange sections critical.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1550 tons, materials and maintenance buildings, Boeing Aircraft Co., Seattle, to Union Steel Co., Los Angeles.

1000 tons, five spillway tainter gates and hoists, Lookout Point dam, Oregon, to Northwest Marine Iron Works, Portland, Oreg., low $432,658 to U. S. Engineer, Portland.

665 tons, cracking plant, Davison Chemical Co., Lake Charles, La., to Orleans Metal & Engineering Co., New Orleans; Consolidated Engineering Co., Baltimore, general contractor.

400 tons, Army warehouse, Auburn, Wash., to Pacific Car & Foundry Co., Seattle.

300 tons, two Army-type floating cranes, to Todd Shipyard Corp., low $218,732, to U. S. Navy.

233 tons, two Chena river, Alaska, bridges, to Fought & Gray, Portland, Oreg.; 67 tons reinforcing furnished by Alaska Railroad; Boen-Sealand Construction Co., Seattle, general contractor.

200 tons, stop logs, beams, etc., Big Cliff dam, to W. H. Reller Co., Boise, Idaho, low $73,325, to U. S. Engineer.

140 tons, steel warehouse addition, Brown-Wales Co., Cambridge, Mass., to West End Iron Works, Cambridge.

STRUCTURAL STEEL PENDING

7100 tons, bridge, Tiverton, R. I.; bids expected in late summer; subcontract earlier taking 3800 tons steel piling and 1100 tons reinforcing bars.

4300 tons, highway-railroad bridge, Fore river, Portland, Me.; bids expected in July.

575 tons, municipal bridge, Baltimore; bids closed May 21.

250 tons, 40 magazines and storehouses, naval ordnance depot, Bangor, Wash.; Grove, Shepherd, Wilson & Kruge, Seattle, low $2,245,751.

125 tons, two waterway crossing power towers, Tacoma, Wash.; Bethlehem Pacific Coast Steel Corp., Seattle, low, $41,400.

REINFORCING BARS . . .

REINFORCING BARS PLACED

465 tons, dehumidified warehouse, naval advance supply depot, Davisville, R. I., to Truscon Steel Co., Boston; Consolidated Construction Co., North Attleboro, Mass., general contractor; 50 tons, fabricated structural steel, Providence Iron & Steel Co., Providence, R. I.

280 tons, Union hospital addition, Framingham, Mass., to Northern Steel Co., Medford, Mass.; John Volpe Construction Co., Malden, Mass., general contractor.

240 tons, cracking plant, Davison Chemical Co., Lake Charles, La., to Southern States Steel Corp., New Orleans; Consolidated Engineering Co., Inc., Baltimore, general contractor.

175 tons, Washington state Napavine bridge, to Bethlehem Pacific Coast Steel Corp., Seattle; general contract to Rumsey & Co., Seattle.

REINFORCING BARS PENDING

925 tons, magazines and ammunition storehouses, Bangor, Wash.; 800 tons to be furnished by the Navy; bids in May 15.

535 tons, new billet, deformed bars; bids in to Bureau of Public Roads, Washington.

350 tons, cell block addition, state reformatory, Monroe, Wash.; Lease & Leighland, Seattle, low, $777,750.

160 tons, two Washington state highway bridges, Pierce and Benton counties; bids to Olympia, May 27.

120 tons, University Congregational church, Seattle; general contract to Sellen Construction Co., Seattle, low $432,440 base.

PLATES . . .

PLATES PENDING

825 tons, storage tanks, including 31 of 50,000-gallon capacity; bids in to Corps of Engineers, Nashville, Tenn.

125 tons, 300,000-gallon elevated steel water tank, Greenport, N. Y.; bids in May 26.

PIPE . . .

CAST IRON PIPE PLACED

425 tons, 20-inch cast iron pipe, Metropolitan district commission, Boston, to United States Pipe & Foundry Co., Burlington, N. J., through contractor.

100 tons or more, system expansion, Camas, Wash., to Pacific States Cast Iron Pipe Co., Provo, Utah.

CAST IRON PIPE PENDING

500 tons, 24, 8 and 6 inch, also fittings and accessories; bids to E. H. T. McGowan, city clerk, Bremerton, Wash., June 4.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Pittsburgh & West Virginia railway, six heavy-duty 2000-hp, diesel electric locomotives to Fairbanks, Morse & Co.

Rutland, four 1600-hp diesel-electric road-switching units, to American Locomotive-General Electric Companies, Schenectady, N. Y.

RAILROAD CARS PLACED

Southern Railway, 1750 seventy-ton triple hopper cars, to American Car & Foundry Co.'s plant in Huntington, W. Va.

Western Pacific, 100 seventy-ton steel welded ballast cars, to Pullman-Standard Car Mfg. Co., Chicago.

RAILROAD CARS PENDING

Texas & Pacific, 200 seventy-ton hopper cars; construction authorized by directors.

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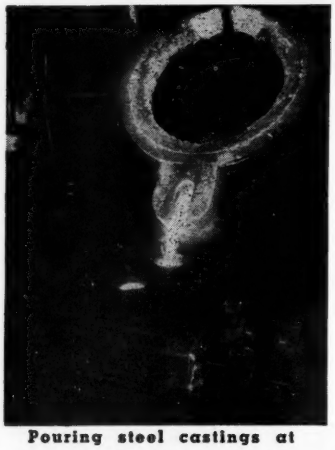

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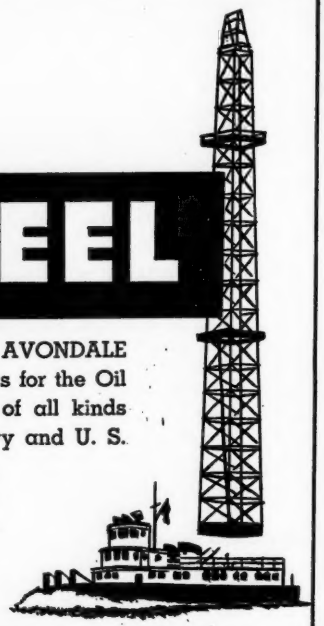

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Here and There in Metalworking . . .

CONSTRUCTION—ENTERPRISE—ORGANIZATIONAL CHANGES

Wire Rope Maker Triples Output

Completion of an expansion program launched in 1951 which has tripled the company's wire rope production and brought current sales to an all-time peak was announced by F. B. Paulsen, president, Paulsen-Webber Cordage Corp., New York. The firm's Brooklyn, N. Y., plant is turning out more than 2 million feet of wire rope monthly for the Navy and for marine and fishing uses.

Interlake Gets Building Permits

Interlake Iron Co., Erie, Pa., has been issued $250,000 worth of building permits, including a $110,000 pig iron casting building, a $100,000 machinery building and another $40,000 structure. The buildings will be part of the firm's large-scale expansion program now under way in Erie.

RCA To Build $3 Million Laboratory

Radio Corp. of America, New York, will build a $3 million electronic experimental laboratory on the outskirts of Moorestown, N. J., some ten miles from the company's main plant at Camden, N. J. The laboratory is scheduled to be finished by the first of the year.

Arma Making Fire-Control Equipment

Arma Corp., Brooklyn, N. Y., subsidiary of American Bosch Corp., was authorized by the Defense Department to start production of an advanced type of tank fire-control equipment. The authority to produce "start-up quantities" allowed for commitment of more than $2 million. It is expected that larger numbers of instruments will be ordered soon.

Valve Research Center Established

A research center was established in Philadelphia by Valve Division, Minneapolis-Honeywell Regulator Co., Minneapolis, to support an extensive development program in industrial valves. An important phase of the research activity will be the determination of suitability of substitute valve materials proposed to relieve the critical alloy situation.

Chicago Bridge Gets Building Award

Chicago Bridge & Iron Co., Chicago, booked a $2,146,000 order for erection of a building at West Milton, N. Y., for the Atomic Energy Commission. Structurals will be fabricated at the firm's Greenville, Pa., plant. The building will house a model atomic submarine power plant.

Olin Industries Buys Ramset

Olin Industries Inc., East Alton, Ill., acquired Ramset Fasteners Inc., Cleveland, a manufacturer of power-actuated industrial tools.

Sub-Zero Products Appoints Agents

Sub-Zero Products, Cincinnati, appointed as its representatives George Keller Machinery Co., Buffalo; Dixie Mill Supply Co., New Orleans; Cleveland Duplex Machinery Co. Inc., Cleveland. Designed to reach temperatures as low as 150 degrees below zero, the Sub-Zero units are making unique advances in the field of metal treatment.

Midwest Foundry & Steel Formed

Midwest Foundry & Steel Inc., Colby, Kans., was granted a charter with $25,000 authorized capital stock. A. Lunsway is the agent at Topeka, Kans.

Taylor-Wilson Moves Offices

Sales and engineering offices of Taylor-Wilson Mfg. Co. are now located in the Keenan building, Pittsburgh.

Orban Gets Additional Agencies

Kurt Orban Co. Inc., New York, was appointed exclusive American distributor for Alfing drill presses, Nube milling machines, Jerwag climb millers, Bammesberger surface grinders, Biernatzki millers, Sinn tool and diemakers milling machines, and Fer-

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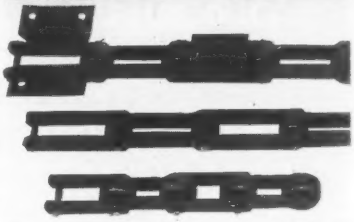

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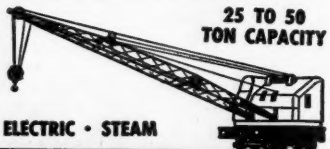

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rari grinders. All but the Ferrari equipment, which is manufactured in Italy, are German-built machines. Replacement parts and engineering service will be available at the Kurt Orban service center in Cleveland.

Research Group To Enlarge Laboratory

Southern Research Institute, Birmingham, will get an addition to its Ingalls laboratory. The new wing will add 12,000 square feet to the institute's facilities.

GE Names Welding Distributors

General Electric Co., Schenectady, N. Y., appointed West Texas Welders Supply Co., Midland, Tex., and Western Oxygen Co., Hobbs, N. Mex., as distributors of its welders, welding accessories and electrodes.

Erie Awards $1.3 Million Contract

Erie Railroad awarded a contract for a $1.3 million diesel-electric locomotive repair shop to be erected in Youngstown to Charles Shutrump & Sons Co. of that city. Construction will start about June 1. Shutrump will erect the building and will install cranes, drop table and other shop machines furnished by the railroad.

Johnson Completes Plant Additions

Johnson Service Co., manufacturer of automatic temperature and air conditioning control systems, completed additions to its E. Michigan street plant in Milwaukee. For the present, most of the additional 100,000 square feet of space will be used for machining and assembling apparatus involved in the defense effort.

Sneed Represents Spring Maker

Sneed Sales Co., Dallas, was appointed sales representative for American Fort-Pitt Spring Division, H. K. Porter Co. Inc., Pittsburgh, producer of hot and cold wound springs for industrial and railroad applications.

Lukens Representative Opens Office

David W. Jones Jr., representative for Lukens Steel Co., Coatesville, Pa., opened offices in the Coby building, 1321 Bannock St. Denver.

Superweld Moves Into New Plant

Superweld Corp., Glendale, Calif., moved into a new plant at 6840 Vineland, North Hollywood, Calif., for copper brazing, bright annealing and product design and development.

Brake Manufacturer Appoints Agent

Wheel Service Co., St. Paul, was appointed a midwestern distributor for Warner Electric Brake & Clutch Co., Beloit, Wis. The Warner firm recently introduced a new braking system for tractor-trailer combinations, which features air brakes on the tractor and electric brakes on the trailer.

Spanning the Chesapeake

The erection of the final 400-ton deck cantilever truss span completed the steelwork of the 4-mile-long Chesapeake Bay Bridge linking the Del-Mar-Va peninsula to the Maryland mainland. Clearing the water by 180 feet, the span is part of 32,000 tons of steel used by Bethlehem Steel Co. in building the world's third longest bridge

Thompson Products Awards Contract

Thompson Products Ltd. awarded a general contract of about $1,250,000 for erection of a plant at St. Catherines, Ont., for the production of aircraft engine parts. The fully equipped plant will represent an outlay of about $5 million.

Standard Steel Enlarges Facilities

Standard Steel Corp., Los Angeles, manufacturer of heavy processing equipment, celebrating its 50th anniversary, is constructing $250,000 worth of buildings and manufacturing facilities. Standard Steel produces rotary dryers and kilns, asphalt plants, fish reduction plants, sugar cubing machinery and does heavy plate and stainless steel fabrication.

Dixon Celebrates 125th Anniversary

Joseph Dixon Crucible Co., Jersey City, N. J., is celebrating the 125th anniversary of its business. There are less than a score of United States business firms that have reached or passed this milestone. Joseph Dixon started his graphite products business in 1827 and incorporated it under its

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present name in 1868. Present officers of the firm are E. M. Cabaniss, president; F. G. Atkinson, executive vice president; H. W. Armstrong, H. B. Van Dorn, and L. A. Behrendt, vice presidents; J. P. Templeton, secretary-treasurer.

Cincinnati Cleaning Names Agent

Cincinnati Cleaning & Finishing Machinery Co., Ironton, O., appointed C. E. Holmes, Birmingham, as its representative in that territory.

Leschen Moves New York Office

A. Leschen & Sons Rope Co., St. Louis, producer of wire rope, moved its New York branch to 75 Varick St. L. J. Clarke is New York district manager.

Steel Warehouse Building Opened

Enos & Sanderson Co. Inc., Buffalo, opened its $300,000 steel warehouse building at 2080 Military Rd. The structure has 35,000 square feet of floor space and has the latest equipment for the handling, cutting and weighing of steel.

Security Steel Granted Charter

Security Steel Corp., Los Angeles, was granted a charter to engage in the iron and steel business in Texas. The agent in Texas is D. E. Wahl, Republic Bank building, Dallas.

Bos-Hatten Selects New Plant Site

Bos-Hatten Inc., Buffalo, steel fabricator, plans to erect a $100,000 plant in West Seneca, N. Y. The company may move its entire operations to the new location.

Wilson Refrigeration Moves

Wilson Refrigeration Inc., a division of Tyler Fixture Corp., is occupying new offices on Glenwood avenue, Smyrna, Del.

WANTED

SALESMEN

Large manufacturer of specialty steel products, located in the East, would like to secure the services of two men, preferably experienced, for the sale of their products. Company produces carbon and alloy hammer and press forgings. Would probably locate one man in the East and one man in the Midwest.

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Metallurgical Engineer, 17 years' experience in Chicago, with best possible connections in chemical, pharmaceutical, and food processing industries, desires additional account. Write Box 503, STEEL, Penton Bldg., Cleveland 13, Ohio.

Help Wanted

MAINTENANCE SUPERVISOR
Large manufacturing company in Midwest. Graduate Engineer—5 years experience actively directing maintenance of heavy equipment, gears, bearings, shafting, etc. State age, education, experience and salary desired. Write Box 515, STEEL, Penton Bldg., Cleveland 13, Ohio.

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Colburn 54" Vert. Boring Mill, 2 heads.
King 42" Vertical Boring Mill, 2 heads.
Niles 42"-50" Driving Box Borer, Burnisher and Facer, late type.
LeBlond #2½ Univ. Miller, 3 SCD.
Hall Planetary Style D Miller.
Gould & Eberhardt 96 H Hobber.
Gould & Eberhardt 18H Gear Hobber.
Heald #50 Internal Grinder.
Landis 10X18 Plain Grinder, late type.
Sellers 4T Tool Grinder, motor drive.
Sellers 6T Tool Grinder, late type.
Landis #2 Universal Grinder, cone drive.
Cincinnati 16 x 96 Plain Cylindrical Grinder.
Landis 16 x 72 Plain Cylindrical Grinder.
Brown & Sharpe #12 Plain Grinder, reversing mechanism.
Heald #70A Internal Grinder.
Heald #78 Centerless Internal & Cylindrical Grinder, late type, complete.
Jones & Lamson 8 x 31 Thread Grinder.
Heald 72-A3 Plain Internal Grinder.
Lodge & Shipley 16" x 6' single pulley drive, 12 spindle speeds.
American 16" x 8', 3 SCD, 56" center distance, 1¼" hole in spindle.
Blount Model B-3 Special Application Lathe for Turning, 20" swing, 2½" hole in spindle, 54" centers.
Lodge & Shipley 20 x 8, single pulley drive, 12 spindle speeds.
Bradford 20" x 18', 4 SCD, 12' center distance, Loose change.
American 36" x 33' center distance, 2⅝" hole in spindle, first class.
American 48" x 10' centers, 2⅝" hole in spindle, first class.
LeBlond 21" x 10' bed, 3 SCD, 5'2" centers.
Gould & Eberhardt 16" Back Geared Shaper.
Gould & Eberhardt 24" Back Geared Shaper.
Gould & Eberhardt 28" Shaper, gear box.
Smith & Mills 32" Shaper, gear box.
Fellows 725 Gear Shaper with Spur Guide.
Fellows 612 Spur Gear Shaper.
Brown & Sharpe 3-26 Gear Cutter.
LeBlond #2 Universal Tool & Cutter Grinder, late type, complete with internal grinding attachment.
Oliver Template Tool Bit Grinder.
Milwaukee 1½B Plain Miller, single pulley drive, double overarm.
Liberty 36" x 36" x 18' Double Housing Planer, 2 rail and 2 side heads.
Lodge & Shipley 16" x 126" centers G.H. Lathe, Timken bearing, complete with taper attachment, late type.
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125 TON, TOLEDO #S-56 TWIN TYPE O.B.I. PRESSES ON S. S. BASE, 3" stroke, 25 x 25" bed area, 12½" shut height.

88 TON, TOLEDO #92½ DOUBLE CRANK, GAP FRAME, 8" stroke, 34 x 66" bed area, 20" shut height.

88 TON, BLISS #4D DOUBLE CRANK, GAP FRAME, 2¼" stroke, 38 x 53½" bed area, 9¼" shut height.

87 TON, BLISS #4½ STRAIGHT SIDE, 4½" stroke, 21 x 27 bed area, 14½" shut height.

75 TON, WELLS DOUBLE CRANK GAP FRAME, 2" stroke, 20 x 80" bed area, 11⅛" shut height.

60 TON, TOLEDO, #203-E DOUBLE CRANK GAP FRAME, 4" stroke, 13 x 55½" bed area, 16" shut height.

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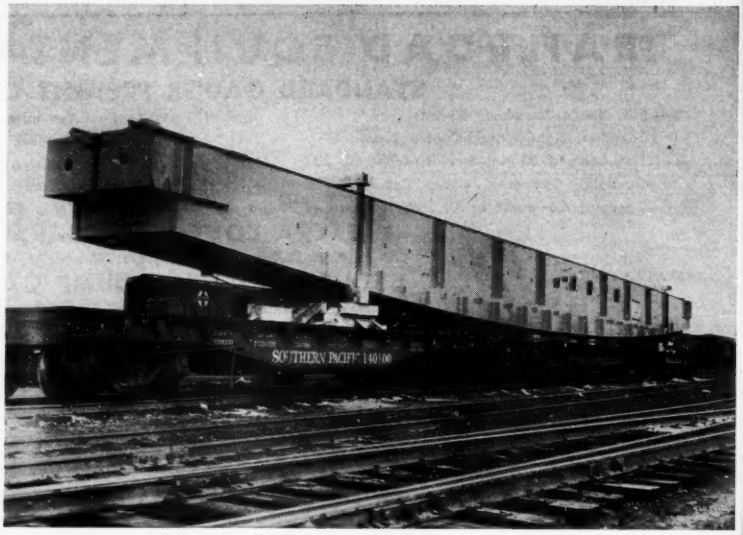

Worried About the Curves

To get this 130-foot P&H overhead-crane girder from its Milwaukee plant to a Pennsylvania buyer, Harnischfeger Corp. and railroad officials charted every curve, bridge and underpass on the way to make sure it would clear. The tightest squeeze was getting the three-car load out of the plant. By shipping it in one piece, the buyer realized savings in cost and labor all along the line

Goodyear Plans $12 Million Project

Goodyear Tire & Rubber Co., Akron, plans a $12 million expansion of its Gadsden, Ala., operations. Daniel Construction Co., Birmingham, was awarded the general contract. Construction will represent about $5 million and new machinery and equipment another $5 million.

Hydropress Consolidates Offices

Hydropress Inc. and its subsidiaries, Loewy Rolling Mill Division and Loewy Construction Co. Inc., are consolidating their offices and will move on June 30 to enlarged quarters in Empire State Building, New York.

Machinery Firm Opens New Plant

Janette Electric Mfg. Co., Chicago, manufacturer of industrial machinery, started full production in its new $1.5 million plant, Morton Grove, Ill.

Metal Buildings Inc. Chartered

Metal Buildings Inc., El Paso, Tex., was granted a charter to engage in the iron and steel business in that state. Incorporators are Clyde E. Hall, Archie B. Cord Jr. and Marvin J. Yates.

Nivert Plans Greenwood Scrap Yard

Albert Nivert & Co., Scranton, Pa., will establish a ferrous scrapyard operation in Greenwood, Pa., at a cost of about $106,000. The company plans to install a large baling press and will erect an office and warehouse building. A railroad siding will be installed for the new plant.

Hewitt-Robins Opens Branch Office

Hewitt-Robins Inc., Buffalo, manufacturer of conveying and vibrating machines, as well as industrial rubber products, opened an additional office in the Porter building, 406 W. 34th St., Kansas City, Mo. Robert E. Crane is in charge of this office.

Fastener Plant Opened in Canada

A new plant for manufacture of Speed Nut fasteners in Canada was opened formally by Dominion Fasteners Ltd. in Hamilton, Ont. The plant will be operated under the direction of F. A. Knight, vice president and general manager, Dominion Fasteners.

Michigan Tool Appoints Agent

Michigan Tool Co., Detroit, appointed Oliver H. VanHorn Co. Inc., New Orleans, as its representative for its gear production and checking equipment and gear cutting tools.

GM Awards Contract for Texas Plant

Contract for construction of General Motors Corp.'s "dual purpose" plant at Arlington, Tex., to be operated by Buick-Oldsmobile-Pontiac Assembly Division, was awarded to Thomas S. Byrne Inc., Fort Worth, Tex.

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- Quonset Hut Window Units
- Industrial Polishing.

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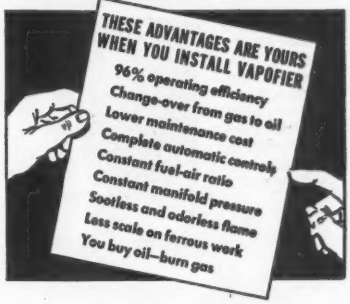
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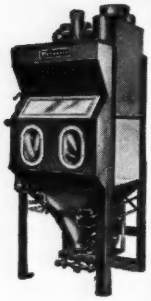

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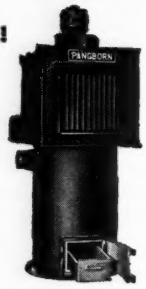

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